

# NAVIGATING THE SWAMP

Lessons on wetland offsetting for Ontario



# Navigating the Swamp: Lessons on Wetland Offsetting for Ontario

July 2017

David W. Poulton, M.A., LL.M.,  
and Anne Bell, Ph.D.

## **Acknowledgements**

The authors gratefully acknowledge the assistance of the following people who provided valuable information and insights: Suzanne Armstrong, Shari Clare, Royal Gardner, Arlene Kwasniak, Larry McDermott, Angus Norman, Joanna Salsberg and Joshua Wise. Further, staff in government agencies and environmental groups across Canada were generous with their time, explaining the various offset systems across Canada. For that we thank Kamal Abdel-Razek, Craig Bishop, Lyle Gawalko, Thorsten Hebben, Peter Joyce, Anish Neupane and Christie Ward. Note, however, that the views presented in this paper do not necessarily reflect those of the aforementioned individuals. Of course, the authors take responsibility for any errors inadvertently made in conveying the information provided by the people mentioned above.

This report was made possible through the generous support of The McLean Foundation.

**The  
McLean  
Foundation**

Review: Sarah Hedges, Ron Corkum

Copy editor: Sarah Weber

Design: Lauren McVittie

Cover photos: (top) Joe Crowley, (left to right) Peter Ferguson, Peter Ferguson, Missy Mandel, Scott Gillingwater

This guide can be downloaded free of charge from the Ontario Nature website, [ontarionature.org/publications](http://ontarionature.org/publications).

Copyright © 2017: Ontario Nature

# Executive Summary

---

The Government of Ontario is proposing to develop a wetland offsetting policy to enable compensation for the negative impacts of development through the restoration or creation of new wetlands. The proposal has garnered considerable interest, both positive and negative, across sectors. On one hand, there is recognition that offsetting represents an opportunity to achieve important conservation gains by integrating the true environmental and social costs of wetland loss into development decisions. On the other, there is understandable concern that if the policy is poorly conceived, implemented or enforced, offsetting will undermine existing wetland protections and open the door to further loss.

As the Ontario government moves forward with its wetland offsetting policy, great care and attention are warranted. If done effectively, wetland offsetting could be a positive force for conservation, helping to reverse the ongoing trend of wetland loss in the province. If done poorly, however, it will do more harm than good.

*Navigating the Swamp: Lessons on Wetland Offsetting for Ontario* explores both the promise and the pitfalls of wetland offsetting, with the aim of informing policy development in Ontario. The report surveys relevant laws and policies in the United States and Canada, as well as those in Alberta, New Brunswick, Nova Scotia, Quebec, Saskatchewan, British Columbia, and Newfoundland and Labrador. It also reviews policy outcomes and lessons learned, particularly from those jurisdictions where wetland offsetting policy has been in place and implemented for many years.

The laws and policies reviewed illustrate a range of approaches to wetland offsetting at various stages of development and implementation. Nowhere is there a resounding success story, where offsetting has been demonstrated to achieve its full potential. Nevertheless, there are positive signs, and many governments are making a concerted effort to learn from the past and develop better ways forward. This report examines the major challenges, highlights best practices and promising approaches, and provides recommendations for the Government of Ontario, based on the evidence presented.

## **Summary of Ontario Nature's recommendations:**

1. The Government of Ontario's wetland offsetting policy should outline the provincial government's role and responsibilities in developing guidance, protocols and performance standards; setting up and managing reliable, publicly accessible information systems; authorizing and recording offsetting transactions; and monitoring and enforcing compliance.
2. The wetland offsetting policy should set clear, measurable performance standards to ensure consistency in program implementation and enable evaluation of program outcomes.
3. The Government of Ontario should commit to providing sufficient funds and expertise to effectively administer and oversee the wetlands offsetting program.



4. The administrative and oversight roles of government with respect to wetland offsetting should be kept distinctly separate and assigned to different government agencies.
5. The Government of Ontario should assign an independent body, such as the Environmental Commissioner of Ontario or a standing committee of experts and stakeholders, to provide regular, periodic review and evaluation of the wetland offsetting program.
6. The wetland offsetting policy should explicitly state that it is to be implemented in a manner that is consistent with the recognition and affirmation of existing Aboriginal and treaty rights in section 35 of the Constitution Act, 1982. It should also clearly indicate how the Crown's duty to consult is to be delegated to third parties, such as municipalities.
7. Ontario Nature recommends that the wetland offsetting policy recognize the right of Indigenous peoples to free, prior and informed consent, and provide relevant guidance.
8. The Government of Ontario should commit to investing the funds and resources needed to positively and proactively engage affected Indigenous communities and knowledge keepers in wetland offsetting planning and decisions.
9. The wetland offsetting policy should apply across Ontario to all key drivers of wetland loss, including infrastructure development and drainage works that are currently exempt from *Provincial Policy Statement* prohibitions.
10. The Government of Ontario should consult farmers and rural landowners to determine and address their unique challenges in preserving or restoring wetlands on their properties, and recognize both their interest in good stewardship and the beneficial role that they could play as offset providers for those who damage or destroy wetlands.
11. The wetland offsetting policy should ensure that provincially significant wetlands and significant coastal wetlands are strictly off limits to all forms of development, and that current protections under the *Provincial Policy Statement* and other provincial land use policies are upheld or strengthened.
12. In setting limits to wetland offsetting, the Government of Ontario should take into account the type, location, vulnerability and irreplaceability of wetlands, as well as their cultural significance to Indigenous peoples. In so doing, it should consider levels of risk and historic loss.
13. Ontario Nature recommends that the goal of the wetland offsetting policy be an overall net gain with respect to the extent and quality of wetland habitats, their functions and Indigenous cultural values.

14. The replacement ratio(s) for wetland offsets should be based on net gain, assuring that the tangible, on-the-ground benefits the offset provides exceed the corresponding losses (i.e., in area, function, Indigenous cultural values). The ratio(s) should reflect risk, uncertainty and time lags.
15. The wetland offsetting policy should stipulate that in determining equivalence, wetland offsets must take into account the quantity (area) and quality of the wetland features and functions, their landscape context, and associated social and economic values. It should provide standards and criteria for assessing and comparing gains and losses.
16. The wetland offsetting policy should position offsetting as the last step within a clear mitigation sequence, the first step and highest priority being to avoid negative impacts. Following this, any unavoidable negative impacts should be minimized to the extent possible. Offsetting, the final step, then offers a means to deal with residual impacts that cannot be addressed through avoidance or minimizing harm.
17. The wetland offsetting policy should define thresholds to be met for avoidance and minimization of adverse impacts, and include the consideration of alternatives. It should require development proponents to document all measures taken to meet the thresholds. It should also require regulators to carry out their own assessments of proponents' efforts to avoid and minimize impacts. Where efforts have been insufficient, the policy should direct regulators to refuse to grant authorizations for proposed developments.
18. The wetland offsetting policy should set out requirements for the consultation and engagement of Indigenous communities at each step of the mitigation sequence (with respect for Constitutional obligations, applicable land use policies and standards established in the United Nations Declaration on the Rights of Indigenous Peoples) and for the application of Indigenous Traditional Knowledge systems.
19. The wetland offsetting policy should outline an approach to siting offsets based on a consideration of the landscape context, desired conservation outcomes, Indigenous cultural values, the potential for long-term success and viability, and the equitable distribution of social costs and benefits.
20. Policy for wetland offsetting should ensure that offsets are designed, both technically and legally, to last in perpetuity, or at least as long as the project's adverse impacts. To deal with time lags between the impact occurring and the full achievement of the offset gains, where possible the offset should be in place before the impact occurs.
21. Averted wetland loss should be considered a valid offset only where it is demonstrated that securement of the wetland provides additional benefits to the baseline scenario, taking into consideration probable future threats and current or anticipated restrictions on the use of the site.

22. The Government of Ontario should carefully examine and provide direction on wetland banking, with input from Indigenous communities, municipalities and stakeholders. If it decides to enable conservation banking, it must address such issues as governance, oversight, limits to offsetting, equivalence, and equitable distribution of costs and benefits among affected communities.

# Table of Contents

---

<b>A. Introduction</b> .....	2
<b>B. Lessons learned from the US experience in wetland offsetting</b> .....	5
Features of the US wetland offsetting system.....	5
Lessons learned.....	7
<b>C. Wetland offsetting policies across Canada</b> .....	10
1. Canada.....	10
Features of the <i>1991 Wetland Conservation Policy</i> .....	10
Offsetting under the Fisheries Act.....	11
Policy Outcomes.....	12
<i>Operational Framework on the Use of Conservation Allowances</i> .....	14
2. Alberta.....	14
Features of the <i>Alberta Wetland Policy</i> .....	14
Strengths and weaknesses of the Government of Alberta's wetland offsetting program.....	17
3. New Brunswick.....	19
4. Nova Scotia.....	22
5. Quebec.....	24
6. Saskatchewan.....	25
7. British Columbia.....	27
8. Newfoundland and Labrador.....	28
<b>D. Issues, lessons learned and recommendations</b> .....	29
1. Governance: Administration, oversight, enforcement and evaluation.....	29
2. Indigenous peoples.....	31
3. Types of land uses to be covered by offsetting policy.....	33
4. Limits to offsetting.....	35
5. Policy goal: net gain.....	38
6. Replacement (multiplier) ratios.....	40
7. Establishing equivalence.....	41
8. Mitigation sequence.....	42
9. Location of offsets.....	46
10. Duration of offsets.....	47
11. Wetland protection or averted loss.....	48
12. Conservation banking.....	49
<b>E. Conclusion and summary of recommendations</b> .....	51
<b>References</b> .....	64

# A. Introduction

---

In July 2017, the Government of Ontario released *A Wetland Conservation Strategy for Ontario 2017–2030* to guide wetland conservation across the province. Intended to provide a framework for awareness raising, knowledge building, collaborative efforts and policy development, the strategy includes a proposal to create an offsetting policy to prevent the net loss of wetlands in Ontario. This policy tool would enable compensation for the negative impacts of development through “the intentional restoration or creation of new wetlands.”<sup>1</sup>

Not surprisingly, the anticipated policy proposal has garnered considerable interest across many sectors. There is real potential, on one hand, to achieve important conservation gains through new requirements to compensate for damage done to wetlands.<sup>2</sup> On the other, there is understandable concern that if the policy is poorly conceived, implemented or enforced, offsetting will undermine existing wetland protections and lead to further loss.

Wetland offsetting is risky business. As Royal Gardner explains, “the incentive to restore a wetland is directly related to the desire to obtain a permit to conduct activities that are harmful to other wetlands.”<sup>3</sup> Indeed, wetland offsetting has been occurring in the United States for over 30 years, though success in achieving its goal of no net loss has yet to be demonstrated.<sup>4</sup> A 2001 report by the US National Research Council revealed that the “no net loss” policy goal for wetlands was not being met, for a variety of reasons.<sup>5</sup> These included weak performance standards and a lack of monitoring, enforcement and long-term maintenance.<sup>6</sup> In their 2012 global meta-analysis of wetland restoration, David Moreno-Mateos et al. conclude that if offsets are used “to justify further wetland degradation, net loss of global wetland services will continue and likely accelerate.”<sup>7</sup> The risks inherent in wetland offsetting hold true for conservation offsetting (also known as “biodiversity offsetting”) more generally. A 2014 report by the International Union for the

## **Public Interest in Wetland Offsetting**

In October 2015, Ontario Nature partnered with Ducks Unlimited Canada to host a workshop on wetland policy and conservation offsetting, with sponsorship from the Ontario Home Builders Association. Eighty-five people representing 55 groups and agencies attended. There was broad interest in wetland offsetting, and 76 percent of participants agreed that it could “create new opportunities to advance conservation goals through the positive engagement of many sectors of society in wetland protection and restoration.” This optimistic outlook was nonetheless tempered with considerable skepticism and an appeal for precaution to ensure that offsetting did not become a “slippery slope” that would undermine efforts to conserve wetlands.<sup>8</sup>



Conservation of Nature (IUCN) found that offsetting has “the potential to provide net gains in biodiversity in the right context, but this has rarely yet been realised in practice.”<sup>9</sup> IUCN policy released in 2016 urges caution:

No two areas of habitat or species populations are identical, and therefore some biodiversity (e.g., genetic combinations) and related values will always be lost in offset exchanges. Given this reality, and the inherent uncertainties and risks linked to offsets, using biodiversity offsets must be a measure of last resort.<sup>10</sup>

As the Ontario government moves forward with its wetland offsetting policy, great care and attention are clearly warranted. If done effectively, wetland offsetting could create new revenue streams for wetland restoration, position industry as a positive force in conservation efforts, and help reverse the ongoing trend of wetland loss in Ontario. If done poorly, however, wetland offsetting will do more harm than good.

Much is at stake. Wetlands provide habitat for over 20 percent of Ontario’s species at risk. They also deliver significant ecosystem benefits, including cleaner water, flood control, erosion reduction (See textbox, “Wetlands and climate change adaptation”), waste treatment and carbon storage, as well as recreational, cultural and spiritual opportunities.<sup>11</sup> Such benefits have been valued in one report at over \$50 billion per year in southern Ontario alone.<sup>12</sup> This is equivalent to a value of \$161,420 per hectare for urban and suburban wetlands.<sup>13</sup>

Historically, however, over 70 percent of wetlands have been lost in southern Ontario, and, despite the wetland policies, programs and partnerships that have been in place for many years, losses continue.<sup>15</sup> Even those wetlands that benefit from the highest level of policy protection – provincially significant wetlands (PSWs) and Great Lakes coastal wetlands – are disappearing. Community groups battle powerful development interests in order to protect PSWs in places like Niagara<sup>16</sup> and York Region,<sup>17</sup> where historic wetland losses

### **Wetlands and climate change adaptation**

Schindler and Bruce outline the critical role of wetlands in climate change adaptation:

“The restoration of wetlands is an effective means to adapt to the impacts of climate change on water quality and quantity in all regions of Canada ... During snowmelt and after heavy rainstorms, they prevent much of the water from running off immediately to nearby rivers, thus helping to prevent floods. As water stands in wetlands, nutrients and toxic chemicals are removed. The infiltrating water recharges groundwater in the area, buffering against the effect of future drought. Thus, a national initiative to identify, preserve and/or restore wetlands that are “key capacitors” within watersheds across Canada should be set as a priority.”<sup>14</sup>

exceed 85 percent in many areas. Meanwhile, lower Great Lakes coastal wetlands have been lost at a rate of 5,336 hectares per year over the last decade, as highlighted in a 2015 Ducks Unlimited Canada analysis.<sup>18</sup>

It is to be hoped that the wetland strategy for Ontario will set the stage to reverse the trend of ongoing decline.<sup>19</sup> The wetland offsetting policy promises to be a critical element in the overall strategy. Fortunately, in developing the policy the government does not have to start with a blank state. The policies and experiences of other jurisdictions in Canada and around the world provide important models and insights for policy development in Ontario.<sup>20</sup>

Accordingly, the purpose of this report, *Navigating the Swamp: Lessons on Wetland Offsetting for Ontario*, is to explore and draw from these other policies and experiences in order to contribute to ongoing discussions about a wetland offsetting policy for Ontario. We begin by summarizing important lessons learned from the US experience, where wetland offsetting has been in place and evolving for several decades. We then review relevant federal and provincial policy from across Canada to identify effective approaches as well as policy gaps. Finally, we examine key policy issues and provide recommendations for government.

### **Ontario Nature offsetting reports**

Since 2013, Ontario Nature has been at the forefront of efforts to build collective understanding about conservation offsetting in Ontario through meetings and workshops with diverse stakeholders, members of Indigenous communities and government representatives. The organization has worked collaboratively with many partners to conduct research, develop guiding principles, and provide recommendations for government and others involved in offsetting initiatives. These efforts are presented in four reports: *Insights into Biodiversity Offsetting in Ontario: Summary of Ontario Nature's 2013–2014 Project* (2014),<sup>21</sup> *Key Issues in Biodiversity Offset Law and Policy: A Comparison of Six Jurisdictions* (2015),<sup>22</sup> *Biodiversity Offsetting in Ontario: Issues, Accomplishments and Future Directions – Summary of Ontario Nature's 2014–2016 Project* (2016),<sup>23</sup> and *Indigenous Perspectives on Conservation Offsetting: Five Case Studies from Ontario, Canada* (2017).<sup>24</sup>

# B. Lessons learned from the US experience in wetland offsetting

To learn about the policy do's and don'ts of wetland offsetting, there is no better place to begin than with the experience of the United States, home to one of the longest standing offset systems in the world. This system has been the subject of considerable review and critique, and has been continually evolving in response to identified needs, weaknesses and concerns. The system underwent a substantial reworking in 2008. Its various incarnations offer a range of experiences and lessons to be learned.

In 2001, the US National Academy of Sciences published *Compensating for Wetland Losses Under the Clean Water Act*, an in-depth report assessing results and presenting detailed recommendations to address shortcomings.<sup>25</sup> This seminal report and other independent critiques spurred major reforms, based on action items set out in the (US) *National Wetlands Mitigation Action Plan*.<sup>26</sup> These action items addressed integrating mitigation into a watershed context, improving accountability, clarifying performance standards, and improving data collection and availability (see textbox, *US National Wetlands Mitigation Action Plan: Action Items*). While the report and the action plan referred to a system that has since been revised, they are substantial enough to merit careful consideration by policy-makers in Ontario.

## Features of the US wetland compensation system

“Wetland compensation” is the term used for wetland offsetting in the United States. The system is based on requirements and processes set out under the Clean Water Act<sup>27</sup> (especially the permitting provisions of Section 404) and associated regulatory guidelines<sup>28</sup> to compensate for dredging or filling that adversely affects wetlands.<sup>29</sup> Since 1990 the goal of the system has been to achieve no net loss of wetlands – though the long-term goal, as set out in statute, is to increase the quantity and quality of wetlands according to both area (acreage) and function.<sup>30</sup>

In terms of governance, the US Army Corps of Engineers administers the wetland compensation system. The Environmental Protection Agency develops policy and provides oversight. This divided jurisdiction, guided by a 1990 memorandum of agreement between the two agencies, ensures more independent program oversight, with arms-length assessment and policy-making kept separate from day-to-day decision making. It also safeguards against the potential for a too close alignment of interests on the part of developers and decision makers in administrative ease at the expense of ecological outcomes.<sup>31</sup>

A defining feature of the system since the outset has been the mitigation sequence, according to which adverse impacts must first be avoided, then minimized and finally offset. The third and final stage – termed “compensatory mitigation” – is to occur only

after “all appropriate and practicable avoidance and minimization” have been achieved.<sup>32</sup> It “may not substitute for avoiding and minimizing impacts.”<sup>33</sup> It is important to note that this endorsement of the mitigation sequence (also known as the mitigation hierarchy) is near universal in offset programs.<sup>34</sup>

Accepted methods of compensation include wetland restoration, creation, enhancement and preservation. The US Environmental Protection Agency explains that wetland restoration and creation offer opportunities to achieve a net gain in wetland function and/or area. Wetland enhancement may result in a net gain of wetland function. Wetland preservation (also known as averted loss) does not achieve net gain, however, and is allowed in limited circumstances only.<sup>35</sup>

The three existing mechanisms for compensation are permittee-responsible mitigation and two forms of third party mitigation: mitigation banking and in-lieu fee mitigation. As the name suggests, in permittee-responsible mitigation the development permit holder is responsible for delivering the offset. In the case of mitigation banking, the permit holder purchases offset credits from a wetland bank, that is, an area that has been previously restored, created, enhanced or preserved and set aside by a third party, and certified for compensation. The “banker” is responsible for the success of the compensation project. In-lieu fee mitigation involves paying funds to an in-lieu fee sponsor (e.g., a public or not-for-profit agency) that later uses the funds for mitigation purposes. Of the three mechanisms, US federal regulations in 2008 established a preference for mitigation banking.<sup>36</sup>

Mitigation banks, a major US innovation, were first established under guidance from the US Fish and Wildlife Service in 1983.<sup>37</sup> The use of this compensation mechanism has grown rapidly since 1995, with the release of federal guidance that provided government agencies and the private sector “the regulatory certainty and procedural framework they needed to move forward.”<sup>38</sup> By 2011, 26 percent of US wetland offsets were implemented through mitigation banks.<sup>39</sup> Understood to address many of the limitations of on-site or single-project offsets, the potential benefits of mitigation banking include:

- opportunities for a more strategic, landscape-based approach to mitigation;
- improved ability to assemble financial resources and scientific expertise;
- more certain outcomes (compensation takes place prior to the adverse impact);
- improved scrutiny (an interagency review precedes authorization to construct and operate a bank, and performance criteria must be met before credits are certified);
- financial assurances for long-term management and protection of the mitigation bank;
- reduced transaction costs and permit processing time;
- unambiguous transfer of liability; and
- easier monitoring and oversight by authorities.<sup>40</sup>

It is important to recognize, however, that in practice many banks have not succeeded due to technical or climatic factors, non-compliance with the bank’s agreement or poor site management.<sup>41</sup>

The offset, whether provided through permittee-responsible mitigation, mitigation banking

or in-lieu fee mitigation, must take place within a “service area,” a geographic area defined by the offset provider and approved by an interagency review team (representing all relevant resource agencies). On the basis of ecological equivalence and proximity the service area prescribes the area where an impact site can permissibly be offset by the authorized compensation project. Since 2008, the assessment of ecological equivalence emphasizes wetland functions, including hydrologic, biogeochemical and physical habitat considerations and measures.<sup>42</sup>

An emphasis on permanence is another defining feature of the US offsetting system. The expectation is that offsets will be permanent where legally possible. For permittee-responsible, banking and in-lieu fee compensation, the legal arrangements for long-term protection must be specified in the mitigation plans. Such arrangements may include conservation easements, restrictive covenants, or the transfer of title to resource agencies or not-for-profit conservation organizations. On public lands, long-term protection may be provided through management plans.<sup>43</sup>

## Lessons learned

1. *Need for reliable tracking, reporting and record keeping:* The primary conclusion of the National Research Council’s 2001 report was that “the goal of no net loss of wetlands is not being met for wetland functions by the mitigation program, despite progress in the last 20 years.”<sup>44</sup> Even though on paper wetland loss was being offset on a net gain basis of 1.8:1 (42,000 acres required for compensation: 24,000 wetlands permitted to be lost), the data were not available to confirm this outcome, or even that the policy objective of no net loss had been achieved. On the contrary, projects were often not undertaken, or if initiated “were poorly designed or carelessly implemented” and failed to meet permit conditions. At most sites, long-term monitoring was not required. Baseline data on wetland functions lost to development were not reported.<sup>45</sup> **The need for measurable performance standards and better tracking, reporting and record keeping was thus a key lesson learned from the early days of wetland offsetting in the United States.**
2. *Need for a watershed-based approach:* The second conclusion of the National Research Council was that “a watershed approach would improve permit decision making.”<sup>46</sup> The council was responding to the strong preference at the time for on-site and in-kind compensation, resulting in projects that lacked the hydrological conditions to achieve intended outcomes and persist over time. Rather than this piecemeal approach, the council recommended that decisions be based on an “assessment of the wetland needs in the watershed and the potential for the compensatory wetland to persist over time.”<sup>47</sup> It held that **individual offset sites should be designed “to maximize the likelihood that they will make an ongoing ecological contribution to the watershed.”**<sup>48</sup> Accordingly, the *US National Wetlands Mitigation Action Plan* sets out several related action items, including the development of guidance on the use of on-site versus off-site compensation, and analysis and identification of criteria for compensatory mitigation within a watershed context (see textbox, p. 9).

3. *Need to adhere to the mitigation sequence:* Despite many statements about the importance of the US wetlands compensation system, a noted weakness is the failure to effectively apply the first two steps of the mitigation sequence – avoidance and minimization of adverse impacts.<sup>49</sup> Morgan Hough and Palmer Robertson provide a detailed historical analysis of the problem, highlighting the emergence of mitigation banking as a major factor: “Skipping directly to the compensation step was seen to increase demand for compensation credits, and thus to support the development of a market in wetland compensation.”<sup>50</sup> As a result,

permit denials are vanishingly rare (only 0.25% of all permit applications were denied in 2004 and 2005), and the regulatory staff may struggle to remember the last time a permit was denied solely for lacking an implementable or enforceable compensation plan, or because remaining significant degradation was simply uncompensatable.<sup>51</sup>

(It is possible, however, that in some cases potential developers had been making avoidance decisions earlier on in the process, in which case they would not be reflected in regulatory records.)

Clare and her co-authors noted in 2011 that throughout North America there is a lack of clarity and dedication to first and foremost avoiding negative impacts on wetlands.<sup>52</sup>

**Clearer direction is needed to support implementation of avoidance.**

4. *Need to ensure compliance:* The National Research Council highlighted the need to ensure that permit holders complied with permit conditions. It noted that inspection and enforcement were not given sufficient priority and that the likelihood of being cited for permit violations was low. **The council recommended that regulatory authorities take action “to improve effectiveness of compliance monitoring before and after project construction.”**<sup>53</sup>



## ***US National Wetlands Mitigation Action Plan: Action Items***<sup>54</sup>

The Environmental Protection Agency developed this list of action items to improve implementation of wetland compensatory mitigation:

### *Integrating Mitigation into a Watershed Context*

- Develop guidance on the use of on-site vs. off-site and in-kind vs. out-of-kind compensatory mitigation
- Develop guidance on the use of vegetated buffers as a potential component of compensatory mitigation
- Develop guidance on the appropriate use of preservation for compensatory mitigation
- Using the guidance developed above, conduct an analysis with Tribes and States on the use of compensatory mitigation within a watershed context and identify criteria for making mitigation decisions in this context

### *Improving Accountability*

- Develop guidance that clarifies implementation of TEA-21<sup>55</sup> preference for mitigation banking
- Continue to provide financial assistance through EPA's wetlands grants program to encourage Tribes, States and others to increase the success of mitigation in their jurisdictions
- Develop guidance for those wetlands for which mitigation, restoration, or creation is not feasible or scientifically viable
- Clarify considerations for mitigation impacts to streams in the Section 404 program

### *Clarifying Performance Standards*

- Develop a model mitigation plan checklist for permit applicants
- Develop guidance adapting the National Research Council's recommended guidelines for creating or restoring self-sustaining wetlands to the Section 404 program
- Analyze existing research to determine the effectiveness of using biological indicators and functional assessments for evaluating mitigation performance
- Building upon the biological indicators and functional assessments research, develop performance standards guidance on monitoring and adaptive management of mitigation sites
- Clarify key concepts related to performance standards

### *Improving Data Collection and Availability*

- Compile and disseminate information regarding existing mitigation-tracking database systems
- Building upon the analysis of existing mitigation database systems, develop a shared mitigation database
- Utilizing the shared database, provide an annual public report card on compensatory mitigation to complement reporting of other wetland programs

# C. Wetland offsetting policies across Canada

---

## 1. Canada

For many years, the Government of Canada's approach to wetland offsetting has been guided by the 1991 Federal Policy on Wetland Conservation<sup>56</sup> and the provisions of the Fisheries Act dealing with physical impacts on fish and fish habitat.<sup>57</sup> The Federal Policy on Wetland Conservation, which applies to federal lands and federally regulated development projects, targets no net loss of wetland functions.<sup>58</sup> Likewise, from 1986 to 2012, the application of section 35 of the Fisheries Act was also guided by the principle of no net loss. Although statutory amendments in 2012 diluted that goal to “the sustainability and ongoing productivity” of identified fisheries, that same year Environment Canada released overall guidance for offsetting in the federal sphere, setting out principles and tools that could lead to higher and more consistent standards of implementation.<sup>59</sup>

### **Features of the 1991 Wetland Conservation Policy**

The overall objective of the Government of Canada's 1991 wetland policy is to “promote the conservation of Canada's wetlands to sustain their ecological and socio-economic functions, now and in the future.”<sup>63</sup> Seven goals are identified to support this objective, including “no net loss of wetland functions on all federal lands and waters.”<sup>64</sup> The adoption of this no net loss goal recognizes that where loss of wetland functions is unavoidable, compensation will be required.<sup>65</sup> Wetland functions are defined broadly as

the natural processes and derivation of benefits and values associated with wetland ecosystems, including economic production (e.g. peat, agricultural crops, wild rice, peatland forest products), fish and wildlife habitat, organic carbon storage, water supply and purification (groundwater recharge, flood control, maintenance of flow regimes, shoreline erosion buffering), and soil and water conservation, as well as tourism, heritage, recreational, educational, scientific, and aesthetic opportunities.<sup>66</sup>

Nine guiding principles, deemed critical to implementation, are outlined in the policy and touch on many issues such as the priority of wetland conservation for the “health and well-being of Canadians,” the Canadian government's international responsibility to conserve wetlands, the need to integrate environmental and economic decision making, the importance of wetland research, the need for public education, and a commitment to “consultation and cooperation with native institutions and representatives.”<sup>67</sup> To help land managers uphold these policy commitments, and to assist in matters such as planning, granting permits, constructing facilities, and buying, selling or leasing land, in 1996 the Canadian Wildlife Service published a guide to implementation, *The Federal Policy on*

## **Ramsar Convention: Conserving Wetlands of International Importance<sup>60</sup>**

The emergence of wetland policies in the last two decades of the 20th century reflected growing global recognition of the ecological, social and economic value of wetlands and the urgent need to conserve them. In 1982 the Government of Canada ratified the Ramsar Convention, an international agreement calling on signatory nations to commit to wetland conservation. Parties to the convention committed to designating and effectively managing Ramsar sites (sites nominated nationally and selected internationally as “Wetland Sites of International Importance”) and promoting the wise use of all wetlands through planning, policy, legislation and education.<sup>61</sup> Canada has 37 designated Ramsar sites covering 13,086,767 hectares. There are eight Ramsar sites in Ontario, covering 2,460,811 hectares: Long Point National Wildlife Area, Matchedash Bay Provincial Wildlife Area, Mer Bleue Conservation Area, Minesing Wetlands, Point Pelee National Park, Southern James Bay Migratory Bird Sanctuaries (Moose River and Hannah Bay), St. Clair National Wildlife Area, and Polar Bear Provincial Park.<sup>62</sup>

### *Wetland Conservation: Implementation Guide for Federal Land Managers.*<sup>68</sup>

Considering that it was written over 25 years ago, the federal government’s wetland policy set a promising precedent in many regards. To begin, it recognized the need to include Indigenous peoples affected by policy implementation in decisions about implementation.<sup>69</sup> It also contemplated setting limits to wetland offsetting in certain situations: “Due to local circumstances where wetland losses have been severe, in some areas no further loss of any remaining wetland area may be deemed essential.”<sup>70</sup> It encouraged a regional or watershed-based approach as a practical framework for implementation,<sup>71</sup> providing “an ecological context for viewing wetlands as functional units in the landscape.”<sup>72</sup> Finally, it emphasized the need for monitoring to establish a sound scientific basis for policy: “Monitor wetland trends from national and regional perspectives so as to establish wetland baselines and statistics for use in targeting of conservation efforts in priority areas.”<sup>73</sup>

## **Offsetting under the Fisheries Act**

In 1986 Canada was one of the first jurisdictions to adopt the “no net loss” principle and to rely on offsetting to conserve fish and their habitat. The principle was to support achievement of the overall policy objective, that being to achieve a “net gain for habitat for Canada’s fisheries resources.”<sup>75</sup> It is important to note, however, that in authorizing projects that would cause harmful alteration, disruption or destruction of fish habitat, the government gave itself ample room for discretion in applying the no net loss principle. The 1986 Policy for the Management of Fish Habitat provides the following guidance for implementation of no net loss:

The principle is intended to guide departmental officials and other interested parties, and should not be interpreted as a statutory requirement to be met

in all circumstances. Professional judgement and common sense applied in an informed co-operative environment by personnel experienced in habitat management, combined with supportive research, will achieve no net loss of productive capacity in the majority of cases.<sup>76</sup>

In 2012, the federal government introduced significant amendments to the Fisheries Act. It changed the goal to “the sustainability and ongoing productivity of commercial, recreational and Aboriginal fisheries.”<sup>77</sup> It also brought the mitigation sequence into the body of the legislation.<sup>78</sup> Although the concept was part of the 1986 policy regime,<sup>79</sup> this change gives the concept more permanence and legal weight, creating a new obligation for the Minister to consider “whether there are measures and standards to avoid, mitigate or offset serious harm to fish that are part of a commercial, recreational or Aboriginal fishery, or that support such a fishery.”<sup>80</sup> A concurrent policy statement in 2013 confirms a clear hierarchy, emphasizing avoidance and mitigation before offsetting, and requires development proponents to submit a plan demonstrating implementation of the hierarchy.<sup>81</sup> The full significance of the legislative and concurrent policy changes at that time is still a matter for conjecture.<sup>82</sup>

#### **Quick Facts from the 1991 Wetland Conservation Policy**

- Canada has more than 127 million hectares of wetlands.
- About one-quarter of the world’s wetland area is found in Canada.
- Since 1800, about one-seventh of Canada’s wetlands have been drained or lost.
- Drainage for agricultural purposes accounts for 85 percent of historic known wetland loss in Canada.
- Urban growth and industrial expansion account for 9 percent of Canada’s wetland loss.
- Wetlands are linked to many federal responsibilities: migratory birds, fisheries, and water resources.<sup>74</sup>

#### **Policy Outcomes**

Assessments of the effectiveness of federal offsetting policies have primarily focused on the fish habitat policy under the Fisheries Act. They indicate that the goal of no net loss has been undermined by weak interpretation and a lack of resources.<sup>83</sup> A 2006 study of habitat compensation projects at 16 sites across Canada conducted by Jason Quigley and David Harper of Fisheries and Oceans Canada found that approximately 63 percent of projects “resulted in net losses in habitat productivity.”<sup>84</sup> They concluded that “habitat compensation, as currently implemented in Canada, is slowing but not stopping the rate of habitat loss.”<sup>85</sup>

Similar to the situation in the United States described above, “poor record keeping and low levels of compliance monitoring” meant that the government agencies in

charge were unable to demonstrate whether no net loss has been achieved.<sup>86</sup> According to a 2009 report of the federal Commissioner of the Environment and Sustainable Development,

Fisheries and Oceans Canada and Environment Canada cannot demonstrate that fish habitat is being adequately protected as the Fisheries Act requires. In the 23 years since the Habitat Policy was adopted, many parts of the Policy have been implemented only partially by Fisheries and Oceans Canada or not at all. The Department does not measure habitat loss or gain. It has limited information on the state of fish habitat across Canada – that is, on fish stocks, the amount and quality of fish habitat, contaminants in fish, and overall water quality. Fisheries and Oceans Canada still cannot determine the extent to which it is progressing toward the Policy's long-term objective of a net gain in fish habitat.<sup>87</sup>

The critiques of the Government of Canada's implementation of its wetland offsetting policy echo many of the lessons learned in the United States, in particular the need for reliable tracking and record keeping, for adherence to the mitigation sequence, and for compliance enforcement. These and other themes emerging from numerous critiques are summarized as follows:

1. Lack of a metric of habitat capacity, which precluded accurate measurement of capacity lost or gained when authorizations were granted and compensation planned, and also precluded measurement of the achievement of policy goals on a regional or national basis.
2. Lack of science capacity to determine baseline conditions, design appropriate compensation measures, or project likely outcomes of either development projects or compensation measures.
3. Lack of monitoring of outcomes of either authorized HADD [harmful alteration, disruption or destruction of fish habitat] or compensation measures.
4. Lack of enforcement.
5. Lack of consistency between and within regional offices.
6. Lack of internal communications and sharing of resources and information.
7. Poor record keeping and a lack of standards.
8. Poor, though improving, allocation of resources, such that low-risk projects received the same attention as high-risk ones.
9. Overall, significant budget restraints.<sup>88</sup>

Additional weaknesses that Warren Noga and W.L. Adamowicz identified include the use of habitat rather than multiple ecosystem services to determine appropriate offsets and the failure to consider landscape-level impacts.<sup>89</sup>

New policy and guidance on offsetting following the 2012 changes to the Fisheries Act emphasize risk-based management: only higher-risk projects require government authorizations that include conditions specific to the project. Lower-risk projects are to be handled through a letter of advice, and medium-risk projects through class or template authorizations.<sup>90</sup> Further, the new policy and guidance require that a common metric be

used in the quantification of losses and gains and that uncertainty and time lags in habitat productivity be addressed in the offset calculations.<sup>91</sup> They also require self-assessment by proponents using standardized tools and express a preference for offsets to be additional (i.e., beyond what would have occurred in the absence of the offset measure) and self-sustaining.<sup>92</sup> While the changes could help to address some of the identified problems, they are not binding. This is particularly problematic given that lax implementation and enforcement have been identified as serious issues.<sup>93</sup> As well, the risk-based approach to management undermines the government's ability to track small projects and thus its ability to assess and manage cumulative impacts.

## ***Operational Framework on the Use of Conservation Allowances***

In 2012 Environment Canada published its *Operational Framework on the Use of Conservation Allowances*. The document briefly reviews the federal experience with offsetting for fisheries and wetlands, and sets out a series of principles and tools for the broader application of offsetting in areas of federal jurisdiction. The framework clearly reiterates the mitigation sequence and calls for the application of many of the standard doctrines of offsetting: equivalency, additionality, consideration of time lags and uncertainty, the need for monitoring and accountability. It is a useful guide to ways in which offsetting should be applied, even if past federal experience is spotty. It is hoped that the clarity of the framework and the increasing level of rigour and science brought to offsetting for fisheries are an indication of a trend to more consistent and principled offsetting in the federal sphere.

## **2. Alberta**

The Government of Alberta's wetland offsetting program is a work in progress, building on the requirements of a 1993 interim wetland policy, as well as the Alberta Wetland Policy released in 2013 (which came into effect province-wide on July 4, 2016). It is the province's first structured offset program,<sup>94</sup> articulating some of the concepts and tools for a broader offset framework that is under development.

### ***Features of the Alberta Wetland Policy***

The goal of the Alberta Wetland Policy is "to conserve, restore, protect, and manage Alberta's wetlands to sustain the benefits they provide to the environment, society, and the economy."<sup>95</sup> The policy centres on the mitigation sequence ("hierarchy"), a defining feature of the Alberta government's management approach since 1993. The primary focus of the mitigation system is "to sustain the full range of wetland functions and benefits."<sup>96</sup> In accordance with the sequence, the policy requires proponents of activities that negatively affect wetlands first to avoid, then minimize and finally compensate for harmful impacts – either through payment of an in-lieu fee or through a wetland "replacement" project. The policy sets out the intent and guiding principles for each step, clearly prioritizing avoidance of wetland impacts as "the primary and preferred response."<sup>97</sup>



The primacy of avoidance is confirmed in the Alberta Wetland Mitigation Directive: “Avoidance is the highest priority for wetland mitigation; Proponents must demonstrate they have made a concerted effort to avoid wetland impacts in their application.” The onus is on the proponent to provide evidence of avoidance, which must include the following:

- Options considered for relocating the activity
- Alternative activities considered in the proposed area
- Modifications considered to the proposed activity
- Comparative analysis of alternative options to the proposed activity
- When there is need to balance wetland avoidance with achievement of the smallest footprint on the landscape, the rationale for this balance must be documented.<sup>98</sup>

The Alberta government’s approach is premised on the concept of “relative wetland value,” which allows wetlands throughout the province to be compared according to five common metrics: biodiversity and ecological health, water quality improvement, hydrologic function, human uses and relative abundance. On the basis of the assessment, wetlands are assigned a value: high (A), moderate (B), moderately low (C) or low (D). The scoring emphasizes function and does not differentiate among types of wetlands. Avoidance and minimization of impacts are to be applied for all wetlands, prior to offsetting, “regardless of their relative wetland value.”<sup>99</sup>

Assessment of relative wetland value is intended to enable cumulative effects management within a broader landscape approach.<sup>100</sup> The Alberta Wetland Mitigation Directive provides a map of Relative Wetland Value Assessment Units (RWWAUs) (see Figure 1) to inform the siting of offsets, though it is not the only factor considered.<sup>101</sup> In general, the RWWAUs are based on the boundaries of watersheds and natural regions. Relative to the site of permanent wetland loss, and in order of priority, replacement wetlands must be located to the extent possible within (1) the same municipal boundary, (2) the same watershed, (3) the same RWWAU, (4)

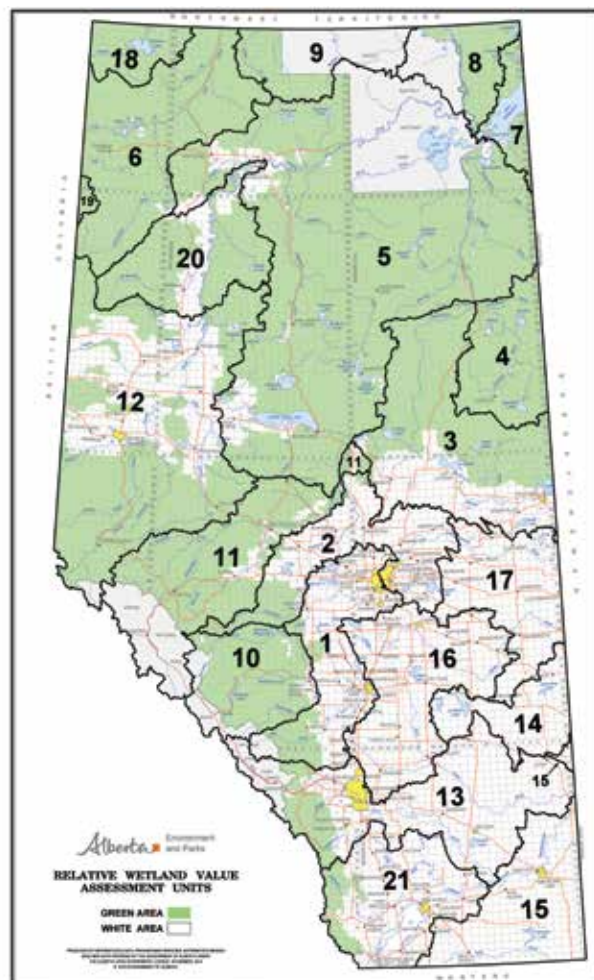


Figure 1: Map of Relative Wetland Value Assessment Units, from Alberta Wetland Mitigation Directive, p.8

the same natural region or (5) areas of high historical wetland loss within the province.<sup>102</sup>

The basic currency of exchange for offsetting is area, with multipliers applied on the basis of the relative wetland value of both the lost wetland and the replacement wetland (see Figure 2). The multipliers are intended to provide a means of managing risk and time lags and of providing an incentive for avoidance of high-value wetlands. The replacement ratios range from 8:1 to 1:8 (hectares replaced, hectares lost).<sup>103</sup> Replacement of wetlands of the same value is based on a ratio of 1:1, which does not account for risk of failure and time lags between impacts and offsets.

Figure 2: Matrix of Wetland Replacement Ratios, from Alberta Wetland Policy, p. 19.

		Value of Replacement Wetland			
		D	C	B	A
Value of Lost Wetland	A	8:1	4:1	2:1	1:1
	B	4:1	2:1	1:1	0.5:1
	C	2:1	1:1	0.5:1	0.25:1
	D	1:1	0.5:1	0.25:1	0.125:1

\* Ratios are expressed as area of wetland

The policy identifies three options for permittee-responsible replacement projects: restoration, enhancement or creation (“construction”). Continuing the practice from the 1993 interim policy, Ducks Unlimited Canada is currently the “primary replacement agent,” though the Alberta government anticipates that soon municipalities, environmental organizations, consultants and others “will be able to deliver the wetland replacement service once a new system has been established.”<sup>104</sup> In-lieu fees are a fourth option, administered by the government, whereby monies are used primarily for wetland replacement projects, but also potentially for “non-restorative replacement” alternatives such as research, monitoring, inventorying, public education and wetland securement.<sup>105</sup> In-lieu fees are the preferred option for most developers who consider payment of fees to be an easier route that relieves them of responsibility for delivering the compensation.<sup>106</sup> The Government of Alberta has set in-lieu fee rates for each of the RWVAUs, ranging from \$17,700 to \$19,400 per hectare on private land and \$10,300 on public land. These amounts are based on average land values in the RWVAU, projected costs of restoration and monitoring, and an administrative fee.<sup>107</sup>

The Alberta Wetland Mitigation Directive introduces a fifth option not addressed in the policy: purchasing credits from a third party wetland bank, described as “a wetland, or collection of wetlands, that have been restored, enhanced or constructed for the explicit purpose of providing wetland replacement in advance of authorized loss of wetland area.” Wetland banking remains an implementation option under development.<sup>108</sup>

A comprehensive information system, including guidance, protocols (on design, validation and verification<sup>109</sup>) and fact sheets, continues to be developed to support the wetland offsetting program. For example, the Wetland Application Checklist is available online to guide development proponents through the stages and requirements of approval for “an activity or water diversion that may impact a wetland.”<sup>110</sup> Of note is a requirement, during the first stage of the approval process, to complete

a preliminary assessment to identify a duty to consult with First Nations regarding potential adverse impacts of a project on the exercise of treaty rights and traditional uses in accordance with Alberta's *Policy on Consultation with First Nations on Land and Natural Resource Management, 2013*.<sup>111</sup>

### **Strengths and weaknesses of the Government of Alberta's wetland offsetting program**

In 1993, Alberta was one of the first Canadian jurisdictions to introduce a wetland policy that incorporated the concept of wetland compensation. More than 20 years later, the Government of Alberta continues to grapple with policy responses to ongoing wetland loss, including offsetting, as evidenced by the 2013 release of the *Alberta Wetland Policy* and later supporting guidance. The government's efforts have been subject to considerable scrutiny, underlining in particular the strengths and weaknesses of recent policy developments.

A strength of the policy framework over the years has been the clear articulation of the mitigation sequence, in keeping with international standards. The 2013 policy provides clear statements of intent, as well as guiding principles for both the avoidance and minimization steps. The mitigation directive, which is subject to periodic updates, further clarifies policy scope, priorities and requirements for development proponents. For example, the directive translates a non-binding principle about minimization of adverse effects into an unequivocal policy requirement: “The Proponent must consider minimization of both direct and indirect impacts on the physical area of the wetland, the relative value of the wetland, or a combination of both.”<sup>112</sup>

Another strength of the Alberta government's approach is the evaluation of wetlands within their larger landscape and social context. The use of the geographical RWVAU classification directs the accrual of the benefits of offsetting to the same ecosystem that suffers the wetland loss to development. This also helps to ensure that the social benefits of the amenities that wetlands provide are not removed from the region (or even the watershed or municipality, if possible). The approach continues in the spirit of the interim

system, whereby Ducks Unlimited Canada was directed to restore wetlands in the same primary watershed as the location of loss, and in the same secondary watershed where opportunities existed.<sup>113</sup>

Despite these strong points, the Alberta government's overall approach to wetland offsetting falls short of several key international standards. The 2013 policy provides no explicit measurable goal such as achieving no net loss or net gain in area and/or function. According to Kwasniak, in the absence of a clear goal the policy "anticipates loss."<sup>114</sup> Indeed, loss of wetland area is the inevitable outcome of a 1:8 (hectares replaced, hectares lost) replacement ratio. Similarly, loss of wetland function is the probable outcome of a 1:1 replacement ratio that fails to account for risks and time lags.

That the Government of Alberta permits in-lieu fees to be allocated for research and education is unusual and troubling. An important 2004 IUCN review of perspectives on offsetting commented on "the 'cynicism' stakeholders and observers would feel if companies presented training and scientific research in lieu of damaged ecosystems."<sup>115</sup> Presumably based on a similar concern, the US federal rule for wetland compensation specifies that expenditures on educational programs are not a valid use of offset funds.<sup>116</sup> In consultation with stakeholders on this point, those responsible for policy design and implementation in Alberta have clearly heard that there is little tolerance for more than 10 percent of in-lieu funds being allocated to these purposes.<sup>117</sup>

Another critical shortcoming of the Alberta government's approach is that it sets no limits on offsetting. There is no mention of any conditions under which a particular wetland would be considered too rare or fragile to be beyond consideration for development and replacement. This is particularly concerning given that the 2013 policy does not distinguish among types of wetlands. All are open for development, and although there is a stated preference for in-kind (like-for-like) offsets, where this is not achievable offsets are to be based on replacing wetland value.

The fact that replacement requirements apply only to permanent losses is another area of concern. Permanent loss excludes activities for which reclamation is eventually required:

Activities associated with a reclamation requirement or a reclamation plan, pursuant to the Environmental Protection and Enhancement Act, are not subject to wetland replacement requirements for the portion of lost wetland explicitly identified for future reclamation.<sup>118</sup>

Such activities are interpreted to result in temporary losses, even though they could include resource extraction activities that have had significant impacts on wetlands in Alberta, such as oil and gas development. These activities may last for decades and are temporary only in the sense that eventual reclamation is required.

Similar concerns arise with respect to forestry and agriculture. Along with the oil and gas industry, forestry is one of the key drivers of wetland loss in northern Alberta.<sup>119</sup> Under the 2013 policy, however, offsets are required for permanent wetland losses only: "Where forestry activities result in a permanent loss of wetland from the landscape, wetland

replacement will be required.” Temporary losses are to be dealt with according to forest management policy, planning and operational processes, which are deemed to set an acceptable standard for avoidance and minimization of adverse impacts.<sup>120</sup>

In southern and central Alberta, agricultural drainage has been the key driver of wetland loss. It is not well understood that the bed and shores of permanent and naturally occurring wetlands (and other water bodies) are public land according to law.<sup>121</sup> Many agricultural landowners have treated wetlands as their own property and have wrongly assumed a right to drain them. The new wetland policy applies to agricultural operations as to other sectors, but its application is complicated by such historical misperceptions.

The scope of the policy is also problematic in that it does not cover ephemeral wetlands such as seasonal creeks and ponds, which are known to play an important ecological role.<sup>122</sup> Nor does it address the duration of the offsets, which, according to international standards, should last at least as long as the adverse impacts.

Historically, political will and adequate government resources to implement the Government of Alberta’s wetland policies have been lacking. In the past government approval writers have often defaulted to the compensation option, without requiring avoidance or mitigation.<sup>123</sup> To fully implement the mitigation sequence, the government will have to overcome the “pervasive culture” whereby compensation is the accepted way to deal with wetland loss.<sup>124</sup> It is hoped that the recent policy statements regarding the primacy of avoidance will trigger such change.

It is also to be hoped that the new protocols and requirements regarding validation and verification will help to increase transparency and ensure that the outcomes of the wetland offsetting program can be evaluated and improved on an ongoing basis. Unfortunately, despite the Alberta government’s commitment to evaluate policy outcomes every five years, no such overall assessment has occurred since 1993.

### **3. New Brunswick**

The Government of New Brunswick’s wetland policy is framed in the language of no net loss. It applies to provincially significant wetlands (PSWs) and all other wetlands greater than one hectare in size.<sup>125</sup> It has two broad objectives: (1) the maintenance of wetland function and (2) securement, stewardship, education and awareness of wetlands. The first objective is distilled into two more detailed objectives: no loss of PSW habitat, and no net loss of wetland function for all other wetlands.<sup>126</sup> (See the textbox below for the definition of PSWs stated in the policy.)

No development activity is permitted in PSWs (or within 30 metres of one) unless its purpose is restoration or it is deemed to provide a “necessary public function.” In the latter case, an environmental impact assessment with public review is required. The draft operational protocols that govern application of the policy clarify that no private development is allowed in PSWs. Public development (such as highways) is subject to a high standard of avoidance requiring adequate consideration of “practicable alternatives”

to wetland alteration.<sup>127</sup>

According to the policy, any alteration within 30 metres of a wetland requires a watercourse and wetland alteration (WAWA) permit, which involves a review process based on a truncated form of the mitigation sequence: avoidance and minimization in the planning stage, and specific mitigation techniques during construction. Although the policy itself does not provide for offsets, a mechanism for that purpose is provided in draft operational protocols. Wetlands that are less than one hectare in size and not contiguous to a watercourse do not require a WAWA permit for proposed alterations.

### **The Government of New Brunswick's definition of "Provincially Significant Wetland"**

Wetlands having provincial, national or international importance for one or more of the following reasons are considered Provincially Significant:

1. Wetlands, such as coastal marshes, which represent a remnant of a formerly more widespread wetland type where, historically, impacts to this habitat type have been severe.
2. Wetlands that are within a designated Ramsar site, National Wildlife Area, Provincial Wildlife Management Area, Migratory Bird Sanctuary, Western Hemisphere Shorebird Reserve Network site, Ecological Reserve, Protected Natural Areas.
3. Wetlands that are project sites under the North American Waterfowl Management Plan and secured for conservation through the Eastern Habitat Joint Venture.
4. Wetlands that contain: one or more Endangered and/or Regionally Endangered Species as designated under the New Brunswick Endangered Species Act; or, other species of special status.
5. Wetlands that represent a significant species assemblage and/or have a high value for wildlife on the basis of size, location, vegetation, diversity or interspersion.
6. Wetlands that have a significant hydrologic value including flood control, water quality protection, recharge or discharge of groundwater.
7. Wetlands that have, or are managed for, social and/or cultural values, including, but not limited to, community, spiritual, archaeological, scientific, educational, and recreational importance.<sup>128</sup>



The explanation of the mitigation sequence in the protocols is strongly worded. At the first stage impacts are to be

avoided to the maximum extent, where possible, by encouraging the selection of alternate projects, alternate designs, or alternate sites for development. Avoidance is always considered the first alternative for any proposed development that may affect a wetland, and will be rigorously applied.<sup>129</sup>

Further, a more stringent approach to avoidance is to be taken where wetland function is exceptional. Examples of exceptional function are offered in the protocols: the presence of endangered species, annual flood protection or storage, and direct treatment of existing contaminants.<sup>130</sup>

The discussion of compensation in the protocols is significant, and is complemented by a published fact sheet on the subject.<sup>131</sup> The protocols make clear that compensation is to be considered only as the final step in the mitigation sequence:

Compensation is not an option routinely available, and is not considered an alternative to project design that avoids and/or minimizes impacts on wetland area and function. This option will not be made available unless DENV [now DELG: Department of Environment and Local Government] is satisfied that all reasonable and practicable alternatives have been explored and exhausted.<sup>132</sup>

Compensation may be undertaken by the permittee directly, usually through retaining the use of a wetland compensation consultant.<sup>133</sup> A permittee may prepare a wetland compensation plan and submit it for approval to the Wetland Mitigation Technical Review Committee, a multi-agency committee chaired by the provincial wetland specialist.<sup>134</sup>

Alternatively, development proponents may meet their wetland compensation obligations by financing an appropriate project from the inventory of pre-approved projects held by a wetland compensation consultant.<sup>135</sup> The largest such consultant is Ducks Unlimited Canada.<sup>136</sup>

Finally, a proponent may meet its offset obligation by payment of an in-lieu fee. The draft protocols provide for the establishment of a provincial wetland restoration fund.<sup>137</sup> That fund has not yet been established, however, which means that all in-lieu fees are arranged with and paid to Ducks Unlimited Canada under a memorandum of understanding that the organization holds with the provincial government.<sup>138</sup> The protocols dictate that the fee charged is to represent the minimum cost of replacing or restoring lost wetland function on a per-hectare basis, but in practice the fee is arranged with Ducks Unlimited Canada without involvement of provincial authorities.<sup>139</sup> This arrangement generally applies to smaller development impacts that do not go through the full environmental assessment process.<sup>140</sup> Currently the standard fee is approximately \$33,000 per hectare, but the fee varies depending on the circumstances of the project. The great majority of compensation obligations are met through the payment of the in-lieu fee, probably because of its quick

turnaround time and administrative simplicity. Ducks Unlimited Canada is required to submit all wetland compensation plans to the Wetland Mitigation Technical Review Committee and is required to complete approved projects on the ground no later than 18 months from the issuance of the specific WAWA permit/ environmental impact assessment in which the need has been determined.

While New Brunswick's system does not enable offset credit banking, it allows an interesting half step in that direction. Wetland compensation consultants may undertake the design and costing of compensation projects in the absence of a specific proponent and submit those projects for approval. This allows them to build up an inventory of pre-approved compensation projects, which can then readily be matched with a proponent's specific needs. The proponent need only arrange to sponsor the work. Because the project is already planned and approved, the time to implementation is likely shortened.<sup>141</sup>

Compensation may be undertaken in the form of (in order of declining preference) restoration, creation, enhancement or protection of an existing wetland.<sup>142</sup> In determining the amount of compensation required, the New Brunswick government applies multiplier ratios, justified by the time lag in new habitats reaching maturity and functionality, and by the risk of partial or total failure of the offset measures.<sup>143</sup> The "base" multiplier for restoration has been 2:1 since 2011 but may rise, because the policy is currently under review.<sup>144</sup> The multiplier is applied on the basis of area of wetland affected.<sup>145</sup> Although the policy indicates that its focus is wetland function, in practice that has proven too difficult to measure so area is used as a proxy.<sup>146</sup>

Like the Alberta government, the Government of New Brunswick has adapted the wetland functional assessment tool, the Wetland Ecosystem Services Protocol. The goal is to assure that the highest function of the wetland lost is identified and adequately replicated in the new compensation wetland.<sup>147</sup>

To its credit, the New Brunswick government has established a compensation tracking database, an Excel record of wetland losses and gains. This step is often overlooked in offsetting systems, including those that ostensibly are dedicated to no net loss. Unfortunately, the database is not publicly available.

The New Brunswick government is undertaking a review of its wetland policy. That process involves First Nations and various stakeholders. Currently First Nations and others are involved in individual projects through the environmental impact assessment process.

#### **4. Nova Scotia**

The overall goal of the *Nova Scotia Wetland Conservation Policy* of 2011 is "to prevent the net loss of wetland in Nova Scotia through wetland conservation practices that integrate the need for wetland protection with the need for sustainable economic development, now and in the future."<sup>148</sup> The policy was established to give guidance on the application of regulatory provisions contained in the Environment Act<sup>149</sup> and the Environmental Goals and Sustainable Prosperity Act,<sup>150</sup> and is relevant to the application of several other regulatory

instruments.<sup>151</sup>

In 2004 the Government of Nova Scotia completed a wetland inventory based on satellite imagery from 2000 to 2002. The Department of Natural Resources<sup>152</sup> regularly updates the wetland inventory, which is available to the public online.<sup>153</sup> Although the government's policy is quite strongly worded in defence of wetlands, it is important to note that its application is circumscribed by these exceptions:

- Wetlands on federal lands;
- Wetlands less than 100 square metres;
- Wetlands constructed for wastewater or stormwater treatment;
- Wetlands artificially created on uplands habitat not for the purposes of wetland compensation (e.g., trout or livestock ponds);<sup>154</sup>
- Wetlands designated as “marshlands” under the Agricultural Marshland Conservation Act;
- Wetlands within agricultural drainage ditches;
- Wetlands that develop unintentionally as a consequence of a development project in the 20 years prior to the policy.<sup>155</sup>

Further, approvals are not required for linear developments less than 10 metres wide and 600 square metres in total area (unless through a wetland of special significance), for periodic or emergency maintenance for public safety or protection of adjacent property, or for harvesting trees or mowing agricultural fields in a wetland.<sup>156</sup> Where these exceptions apply, the Nova Scotia government merely encourages avoidance and the use of best management practices to protect wetlands.<sup>157</sup>

The policy articulates four strategies and objectives to pursue the overall goal, the first of which directly addresses offsets:

Objective 1: To manage human activity in or near wetlands, with the goal of no loss of Wetlands of Special Significance and the goal of preventing net loss in area and functions for other wetlands.<sup>158</sup>

Obviously this objective prescribes the ranking of Nova Scotia's wetlands into two categories, those that are of special significance and those that are not. Wetlands of special significance (WSSs) include all salt marshes, all wetlands within designated Ramsar sites, parks, protected areas, or lands legally protected by charitable land trusts, project sites under the North American Waterfowl Management Plan, wetlands known to support federally or provincially listed species at risk, and wetlands specially designated under the provincial Environment Act.<sup>159</sup>

WSSs are to be protected against any alteration, with two exceptions:

- alterations that are required to maintain, restore, or enhance a WSS;
- alterations deemed to provide necessary public functions.<sup>160</sup>

In the language of the mitigation sequence, WSSs are to be entirely avoided or treated as

“non-offsetable,” subject to the above two exceptions.

All steps of the mitigation sequence apply to other wetlands. The objective is to prevent net loss by allowing all steps of the sequence, including offsetting (“compensation”).<sup>161</sup> Compensation is intended to “create a healthy and sufficiently sized wetland to make up for the loss of habitat and the role the wetland played before being altered for development” and to “balance any loss.”<sup>162</sup>

Multipliers apply in calculating the offset required, using a currency of area (hectares) and varying according to the method of offsetting used: a multiplier of 2:1 is used for restoration or expansion, 3:1 for enhancement and 4:1 for creation of a new wetland.<sup>163</sup> Other activities such as protection of existing ecologically significant wetlands, construction of stormwater retention wetlands, research and education programs may be considered as forms of compensation, but usually only in conjunction with the more standard restoration, enhancement or creation efforts.<sup>164</sup>

The offsetting process is to be administered through the application process under the auspices of the provincial Ministry of the Environment. There is no option of paying an in-lieu fee. Rather, the ministry encourages development proponents to draw on the expertise of professional wetland experts in planning both development and compensation. Proponents pay a wetland restoration professional to complete a restoration project on their behalf through a “letter of understanding” mechanism. Two wetland restoration groups, Ducks Unlimited Canada and East Coast Aquatics, have memoranda of understanding with the provincial government whereby it pre-accepts a number of proposed wetland restoration projects on an annual basis or as needed.<sup>165</sup> The ministry provides a simplified application for projects affecting less than half a hectare of a single wetland, as well as a standard application for all others.<sup>166</sup>

Interestingly, those sites which are restored, enhanced, created or protected in order to establish offsets are to be treated in the same manner as WSSs.<sup>167</sup> This is in contrast to the Alberta government’s developing policy which is considering that offsets may be further disturbed so long as further “offsetting for offsets” is carried out.

## **5. Quebec**<sup>168</sup>

In 1993 the Government of Quebec expanded the application of its Environmental Quality Act<sup>169</sup> to regulate the conversion of wetlands to other uses. Although compensation was not an initial requirement under the permitting process, since 2006 permit applications must include a mitigation sequence.<sup>170</sup> On June 16, 2017, the Government of Quebec passed new legislation, An Act Respecting the Conservation of Wetlands and Bodies of Water, which requires consideration of the mitigation sequence for approvals and enshrines the principle of no net loss.<sup>171</sup>

A 2016 study by Monique Poulin et al. indicates that law and policy in Quebec are failing to prevent or offset the loss of wetlands in the province. The two-part analysis examined (1) permits issued provincially between 2006 and 2010, comparing the total extent of

permitted wetland area loss to the extent and type of mitigation actions undertaken; and (2) the percentage of wetland losses attributable to permitted versus unpermitted activities in the St. Lawrence lowlands, based on a mapping exercise.

The provincial analysis revealed that 558 permits were issued for wetland disturbances between November 2006 and March 2010, covering an area of 2,870 hectares, yet only 15 hectares of wetland were restored or created to compensate, resulting in a net wetland loss of over 99 percent.<sup>172</sup> An additional 621 hectares of wetland were protected and 1 hectare was enhanced, though neither approach offset the wetland area lost. The mitigation sequence was applied for 323 permits (59 percent), with one permit involving partial avoidance, 67 permits involving minimization only and 255 permits (79 percent) leading to compensation. Whether early avoidance for at least part of the affected wetlands occurred during permit negotiations is possible, though not documented. Indeed, detailed records of compensation were available for only 162 of the 255 permits. Disturbingly, about 80 percent of the documented compensation was for forest protection, which, the authors point out, is “useless for preventing regional wetland loss.”<sup>173</sup>

The St. Lawrence lowlands case study covered an area of 29,096 square kilometres, including 3,017 square kilometres of wetlands within a heavily populated part of the province where its highest level of agricultural activity occurs. The mapping assessment showed that 56,681 hectares of wetlands in the region were disturbed between 1990 and 2011, representing about 19 percent of their total extent. Of this total, 22,534 hectares were disturbed from 2006 to 2011, yet permits were issued for only 500 hectares. This large discrepancy is explained by the fact that most of the disturbances resulted from agriculture (44 percent) and forestry (26 percent), two activities for which permits were not required. As the authors explain, “these two industrial activities were primarily responsible for wetland losses, yet they were totally absent from the permitting procedure.”<sup>174</sup> Most of the permits issued were for residential and industrial/commercial development (63 percent) and cranberry farming (33 percent), which together accounted for 19.5 percent of the wetland area disturbed. Seventy-five percent of permits were for projects affecting wetlands smaller than one hectare.

Poor record keeping and lack of monitoring, enforcement and compliance have plagued the Quebec government’s approach to wetland conservation and offsetting. Morin et al. underline the need for clear guidelines, permit requirements that apply to all industries, monitoring standards to demonstrate the effectiveness of compensation, a watershed-based approach that can address cumulative losses, and a compensation ratio of at least 2.5:1 for wetland creation and restoration.<sup>175</sup>

## **6. Saskatchewan**<sup>176</sup>

The Government of Saskatchewan has been developing a series of mitigation guides for specific valued ecosystems, all incorporating the mitigation sequence and offsetting. For the most part these guides have been stimulated by the needs of particular regulatory and permitting applications, so they have been somewhat reactive in nature. Work on the wetland mitigation guide began proactively, however, as a way to leverage potential

conservation markets, manage non-agricultural industry impacts on wetlands, and provide tools that would help industry proponents more readily develop a mitigation plan acceptable to the government.<sup>177</sup> None of the guides is complete yet, nor have they been officially published.

Draft principles common to these mitigation guides include the following:

- The central tenets of the mitigation sequence: avoid, minimize/reclaim, offset, monitor
- Early planning to avoid and minimize harmful impacts
- Accounting for special values
- Factoring in time lags and uncertainties
- Maintaining the health of whole ecosystems, rather than applying “Band-Aid” solutions
- Compensating only as a last resort, and then doing so deliberately
- Using science-based measures for quantification and equivalency
- Using accepted guidelines and procedures
- Holding the proponent to be primarily responsible for the cost (i.e., the polluter pays)

Work on the wetland mitigation guide began in 2011 and is now nearing finalization. The guide articulates the above considerations. Use of the guide is intended to be voluntary, but conceivably regulators could require its use as a condition of approval for proposed projects, thereby setting a standard for proponents.<sup>178</sup>

The draft wetland mitigation guide provides guidance on avoidance and minimization, and also presents a formula-based approach to help proponents estimate functional habitat loss at the development site, and incremental improvements at the compensation site in order to rationalize an appropriate offset. A system of habitat debits and credits is used, along with “value multipliers” to capture characteristics at the development and offset sites.

Value multipliers are included on both sides of the ledger to account for the following:

- Whether “wetlands of special concern” are adversely affected or conserved
- Local scarcity or loss of affected habitat
- Ecosystem services lost or gained
- Number of wetlands adversely affected or conserved
- Anticipated benefits or impacts on species of concern

The nature of the offset project is incorporated into the calculation using “discount multipliers” on the offset side of the equation. In general, approaches that restore or reclaim habitat are valued more highly than projects that protect existing habitat and result in only marginal improvements in habitat function. Likewise, longer-term, more permanent offsets are valued more highly than short-term agreements. Approaches that have a proven track record and a high likelihood of success are estimated to have more value than “risky” approaches that haven’t been proven to perform in the circumstances envisioned.

This combination of factors is intended to encourage proponents to seek out lowest-cost alternatives: to avoid development that will adversely affect high-value habitat, and where unavoidable effects do occur, to seek out the best-quality, highest-value offset projects in order to optimize performance and minimize costs. To increase flexibility for proponents,



the wetland mitigation guide allows proponents to select offset sites within the same watershed or ecoregion; no premium is put on proximity to the development site except where populations of spatially distinct species are the target of mitigation action. The approach of the wetland mitigation guide has been piloted with three test cases. In each case proponents have used environmental non-governmental organizations as offset service providers. The feedback has generally been positive, and industry has acknowledged the value of clear guidance. Some interest in conservation banking has been articulated. Greater clarity on Ministry of Environment expectations is still being sought.

## 7. British Columbia

The Government of British Columbia does not currently have a stand-alone wetland mitigation /offsetting policy or specific approach to wetland compensation. Rather, wetlands are addressed through the government's *Environmental Mitigation Policy*<sup>179</sup> and the procedures prescribed pursuant to it.<sup>180</sup> These documents lay out at some length the principles, consideration and practices that should inform proper offsetting.<sup>181</sup>

The policy was endorsed for implementation across British Columbia's natural resource sector in 2014, and serves as a decision-support tool for provincial staff and statutory decision makers. Because the policy does not convey legal authority, it is not mandatory for proponents, but rather provides a series of guidelines for the voluntary avoidance, minimization, restoration and offsetting of environmental damage caused by development. It is applicable to all ecosystems, both terrestrial and aquatic. Even though the policy is not mandatory, development authorities may choose to apply it as a standard in their consideration of project permitting. This is expected to act as an incentive for development proponents to proactively consider the guidance of the policy and procedures.

To support the British Columbia government's *Environmental Mitigation Policy*, additional guidance for estimating and enabling in-lieu payments as a form of compensation is under development.

The Government of British Columbia currently uses a variety of legislation and regulations to protect wetlands but does not have legislation specifically derived for wetland conservation. The government, however, will be developing a wetland conservation policy; initial engagement on policy development is to begin in 2017, and development of the policy is expected to take approximately two years. It may include guidance on wetland delineation, a rating tool for wetland type and function, and specific guidance on acceptable conservation, restoration or offset measures.<sup>182</sup> If at some point in the future the necessity of giving statutory protection to wetlands is determined, legislation may then be considered.

## 8. Newfoundland and Labrador

In the province of Newfoundland and Labrador the protection and development of wetlands is governed by the Policy for Development in Wetlands.<sup>183</sup> Noting that “there is room for more development to occur to meet social and economic needs, as long as hydrologic and environmental impacts are minimized,” the stated objective of the policy is “to permit developments in wetlands which do not adversely affect the water quantity, water quality, hydrologic characteristics or functions, and terrestrial and aquatic habitat of the wetlands.”<sup>184</sup>

The focus of the Government of Newfoundland and Labrador’s policy is on avoidance and mitigation of loss, rather than on compensation. Any development proposal must have a permit to alter a body of water. The fee to apply for such a permit is substantial (having recently been raised to \$2,000). The application is subject to a thorough environmental assessment, and that assessment will often give rise to strict conditions to avoid or minimize adverse impacts on wetlands. If the assessment reveals that any of the following three circumstances, set out in the policy, apply, then the development will not be permitted:

5.5.1 Infilling, drainage, dredging, channelization, removal of vegetation cover or removal of soil or organic cover of wetlands which could aggravate flooding problems or have unmitigable adverse water quality or water quantity or hydrologic impacts will not be permitted.

5.5.2 Developments of wetlands which are located within the recharge zones of domestic, municipal or private groundwater wells will not be permitted.

5.5.3 Placing, depositing or discharging any raw sewage, refuse, municipal and industrial wastes, fuel or fuel containers, pesticides, herbicides or other chemicals or their containers, or any other material which impairs or has the potential to impair the water quality of wetlands will not be permitted.<sup>185</sup>

In addition to these categories to which an absolute ban applies, it is intended that the combination of high application fees, rigorous environmental assessment and the prospect of strict permit conditions will act as a deterrent, motivating proponents to avoid wetlands.<sup>186</sup>

The Government of Newfoundland and Labrador does not currently have a classification of wetlands, such as provincially significant wetlands, though it may develop such a system in the future.<sup>187</sup> Its policy does not provide for physical or financial compensation for wetlands lost, after application of its procedures for avoidance and minimization.

# D. Issues, lessons learned and recommendations

---

The laws, policies and guidance reviewed above illustrate a range of approaches to wetland offsetting at various stages of development and implementation. Nowhere is there a resounding success story, where offsetting has been demonstrated to achieve its promise. Nevertheless, there are positive signs, and many governments are making a concerted effort to learn from the past and develop better ways forward. This section examines the major challenges, highlights best practices and promising approaches, and provides recommendations for the Government of Ontario, based on the evidence presented.

## 1. Governance: Administration, oversight, enforcement and evaluation

The Ontario government's wetland conservation strategy states that the "identification of clear roles and responsibilities for implementation" will be a key consideration in the development of the government's wetland offsetting policy.<sup>188</sup> Given the risks and uncertainty inherent in wetland offsetting, defining the role of government in administering, overseeing, enforcing and evaluating policy is of primary importance. Falling short in any of these roles will undermine achievement of policy objectives, as illustrated in several of the jurisdictions discussed above.

In terms of administration, the government must ensure that sufficient funds and expertise are available to develop guidance, protocols and performance standards; to set up and manage reliable, publicly accessible information systems; and to support, authorize and record offsetting transactions.<sup>189</sup> According to Shari Clare and Irene F. Creed, one of the most significant limitations to effective wetland management in many jurisdictions is the lack of "credible and accurate inventory data" that are "freely and publically available."<sup>190</sup> While the Ontario government maintains a wetland inventory, improving it – through, for example, more current and detailed mapping and improved accessibility of wetlands data – is a priority action identified in the wetland conservation strategy.<sup>191</sup> In addition, an effective wetland offsetting program would require careful tracking of offset impacts and gains over time, including both sufficient baseline surveys before project impacts have occurred and continued surveys afterwards to measure losses and gains.<sup>192</sup>

The need for measurable performance standards and better tracking and record keeping is a fundamental lesson learned from wetland offsetting in the United States, Canada and Alberta. The absence of clear standards has resulted in a high degree of subjective interpretation, inconsistency and uncertainty in wetland permitting decisions.<sup>193</sup> The lack of reporting and compliance monitoring has left governments unable to ascertain whether policies are working, whether targets are being met and what adjustments are needed to achieve targets and policy objectives. A successful wetland offsetting program in Ontario will require government funding and resources sufficient to ensure that regular reporting

and monitoring occur.

Effective implementation of a wetlands offsetting program will also require enforcement capabilities to drive compliance with permit conditions and performance standards. As noted by Gardner, once permits are granted, the incentive to implement required actions “effectively dissipates” unless regulators exercise oversight. The challenge, he explains, is “to ensure that an incentive – such as avoiding fines, penalties and bad publicity – remains in place to prod recalcitrant permittees to meet their legal obligations.”<sup>194</sup>

**Recommendation 1:** The Government of Ontario’s wetland offsetting policy should outline the provincial government’s role and responsibilities in developing guidance, protocols and performance standards; setting up and managing reliable, publicly accessible information systems; authorizing and recording offsetting transactions; and monitoring and enforcing compliance.

**Recommendation 2:** The wetland offsetting policy should set clear, measurable performance standards to ensure consistency in program implementation and enable evaluation of program outcomes.

**Recommendation 3:** The Government of Ontario should commit to providing sufficient funds and expertise to effectively administer and oversee the wetlands offsetting program.

The government’s role in day-to-day administration (e.g., permit approvals) should be kept distinctly separate from its role in program oversight. This separation of duties is needed, first of all, to avoid conflicts of interest. As noted by the IUCN, “conflicts of interest may arise when the same institution is setting policy frameworks and/or operating offsets, while seeking offsets for public sector projects and possibly benefitting from offsetting schemes.”<sup>195</sup> Indeed, participants at the conservation banking workshop hosted by Ontario Nature and the Toronto and Region Conservation Authority in March 2016 raised this issue. At that event, support was strong for “an independent oversight body to regulate, monitor and keep track of projects and to deal with conflicts of interest.”<sup>196</sup>

A second reason for separating the administrative and oversight roles is the shared interest of regulators and development proponents in avoiding uncertainty, delays and transaction costs. This interest in efficiency, while legitimate, is not necessarily well aligned with the public interest in wetland protection, including avoidance of adverse impacts, premised on a consideration of multiple wetland values and risks. Clare et al. show, for example, that despite the authority to deny permits, wetland regulators in Alberta have rarely done so in the past, given the strong impetus to approve development plans.<sup>197</sup> To help deal with this inherent tension, many jurisdictions have divided administrative and oversight responsibilities among different levels or agencies of government.<sup>198</sup> In the United States, for example, the Army Corps of Engineers administers wetland offsets and approves permits, while the Environmental Protection Agency sets policy, provides oversight and has the authority to override permit approvals. Even then, the “administrative momentum” to make things work for the proponent is so strong that regulators in the United States seldom deny approvals (less than 1 percent) and focus instead on ways to achieve the

proponent's desired outcome.<sup>199</sup>

The alignment between regulators' interests and those of development proponents underscores the need for regular and independent evaluation of program outcomes against policy objectives. The IUCN calls for independent and public review of monitoring and evaluation systems to inform adaptive management.<sup>200</sup> In Ontario, this role could be assigned, for example, to the Environmental Commissioner of Ontario, with a requirement to report to the Legislature at regular intervals. Another alternative would be to establish a standing independent committee made up of experts and stakeholders to provide periodic review and vouch for the integrity of the system.<sup>201</sup> This would have the added advantage of creating a corps of "ambassadors" who understand the workings of the system and could speak to their constituency groups. The Ontario government would set an important national precedent, since no other Canadian jurisdiction has provided such a structure for independent oversight of wetlands offsetting.

**Recommendation 4:** The administrative and oversight roles of government with respect to wetland offsetting should be kept distinctly separate and assigned to different government agencies.

**Recommendation 5:** The Government of Ontario should assign an independent body, such as the Environmental Commissioner of Ontario or a standing committee of experts and stakeholders, to provide regular, periodic review and evaluation of the wetland offsetting program.

## 2. Indigenous peoples

The Government of Ontario's wetland offsetting policy must set the stage for the respectful engagement of Indigenous peoples for the benefit of all. As noted in the draft wetlands strategy, the "livelihoods, food security and cultural heritage of Indigenous Peoples are often connected to wetlands." Theirs is a unique relationship with the land that "pre-dates the existence of the province."<sup>202</sup> It is certainly encouraging to note that one of the core principles underpinning the draft strategy states that "wetlands should be conserved in a manner that recognizes and is informed by the Aboriginal and treaty rights, as well as the interests of First Nation and Métis communities."<sup>203</sup>

The US and Canadian policies reviewed above provide little to no guidance on the engagement of Indigenous peoples in wetland offsetting. The Government of Canada's wetland conservation policy, written over 25 years ago, simply recognizes the need to include affected Indigenous communities in decision making. The US 2008 wetland mitigation rule requires "government-to-government consultation with Indian tribes" where an offsetting program may affect "tribal resources, tribal rights, or Indian lands."<sup>204</sup> The Alberta government requires development proponents to complete a preliminary assessment to identify a duty to consult with First Nations during the first stage of the approvals process.

In Ontario, as elsewhere in Canada, the Crown owes a legal duty to consult Indigenous

peoples when “considering a decision that may adversely affect established or asserted Aboriginal or Treaty rights.”<sup>205</sup> Presumably this duty would apply to wetland offsets, though in conservation offsetting practice more broadly speaking, consultation and accommodation of rights have not always been adequately addressed.<sup>206</sup> According to Clara MacCallum and Leela Viswanathan, Aboriginal and treaty rights in the Ontario municipal context “have been continually undermined and neglected,” as evidenced by land use conflicts and the “habitual destruction of First Nations heritage due to municipal growth and construction.”<sup>207</sup> Despite the call for provincial policy and guidance, “land use developments continue to be approved that would harm First Nations sacred sites located on traditional territories encompassed within municipal boundaries.”<sup>208</sup>

Sheri Longboat writes that “the role of Indigenous consultation and engagement in land use planning and development continues to evolve in response to a changing legal and policy landscape.”<sup>209</sup> In 2014, the Government of Ontario revised the *Provincial Policy Statement* under the Planning Act in a way that clarifies responsibilities: “This Provincial Policy Statement shall be implemented in a manner that is consistent with the recognition and affirmation of existing Aboriginal and treaty rights in section 35 of the Constitution Act, 1982.”<sup>210</sup>

Since the release of the final report of the Truth and Reconciliation Commission of Canada in 2015, the federal government has committed to adopting and implementing the United Nations Declaration on the Rights of Indigenous Peoples, and the Ontario government has pledged to work with the federal government on the same.<sup>211</sup> How these internationally recognized rights, including the right to free, prior and informed consent, will be enshrined in Canadian law and policy remains to be seen.<sup>212</sup> The drafting of the wetlands offsetting policy provides a prime opportunity for the Government of Ontario to demonstrate its commitment to reconciliation and to the adoption and implementation of the rights of Indigenous peoples.

Members of Indigenous communities involved in conservation offsetting in Ontario have identified honouring the right to free, prior and informed consent as a matter of utmost importance. Those working with Ontario Nature to draft guiding principles for engagement articulated the following first principle:

The right to Free, Prior and Informed Consent is one of the key principles of international and domestic human rights law to protect Indigenous peoples from destruction of their lives, cultures and livelihoods.<sup>213</sup> A community has the right to give or withhold its consent to proposed projects that may affect the lands they customarily own, occupy or otherwise use. To ensure effective participation of Indigenous communities in decision-making about conservation offsets, this internationally and nationally recognized right must be honoured in principle and in practice. This includes, but is not limited to, the evaluation, selection, design, implementation and monitoring of conservation offsetting projects. All Indigenous communities affected by a proposed project must have the opportunity to give or withhold their consent.<sup>214</sup>

Ontario Nature hopes that the Ontario government's wetlands offsetting policy will recognize this right and thus encourage all levels of government to invest the financial and personnel resources needed to ensure that affected Indigenous communities are positively and proactively engaged in wetland offsetting planning and decisions. Such an outcome will require, among other things, promoting the application of Indigenous Traditional Knowledge in decision making, "with the approval and involvement of the holders of such knowledge," as required of parties to the Convention on Biological Diversity.<sup>215</sup> Although the wetland conservation strategy commits to supporting Indigenous communities "in collecting, storing and managing local and traditional ecological knowledge related to wetlands,"<sup>216</sup> actually applying such knowledge in planning and decision making will require dedicated resources and a concerted effort to work respectfully across cultures and overcome widespread institutional resistance.<sup>217</sup> The commitment to work with Indigenous communities to include local and traditional knowledge in conservation strategies and best management practices <sup>218</sup> is encouraging.

**Recommendation 6:** The wetland offsetting policy should explicitly state that it is to be implemented in a manner that is consistent with the recognition and affirmation of existing Aboriginal and treaty rights in section 35 of the Constitution Act, 1982. It should also clearly indicate how the Crown's duty to consult is to be delegated to third parties, such as municipalities.

**Recommendation 7:** Ontario Nature recommends that the wetland offsetting policy recognize the right of Indigenous peoples to free prior and informed consent, and provide relevant guidance.

**Recommendation 8:** The Government of Ontario should commit to investing the funds and resources needed to positively and proactively engage affected Indigenous communities and knowledge keepers in wetland offsetting planning and decisions.

### 3. Types of land uses to be covered by offsetting policy

According to the Ontario government's wetland conservation strategy, a key consideration in the development of the wetland offsetting policy for Ontario will be

understanding the types of land or resource use that would be subject to a wetland offsetting policy. This includes consideration of local and regional issues affecting wetlands, the variety of existing land use planning frameworks in the province, other permitting requirements and need for compliance.<sup>219</sup>

In Ontario, as elsewhere across Canada, land uses and their impacts on wetlands vary significantly in the north and in the south. As noted in the strategy, land conversion due to agriculture and urban development has been the primary cause of wetland loss in southern Ontario. While these factors are a concern in the more settled regions of northern Ontario,

pressures from activities such as mining, hydro-electric and alternative energy development, and transportation infrastructure are more common. Longer-term, climate change is also expected to have a significant impact on wetlands in northern Ontario, particularly on peatlands in the Far North.<sup>220</sup>

Wetland policy in provinces such as Alberta and Ontario has reflected geographically driven land use differences for many years, with more stringent wetland protections applying in the heavily developed south where wetland loss has been more intense. For example, in Ontario the strict *Provincial Policy Statement* prohibition on development in provincially significant wetlands applies only in Ecoregions 5E, 6E and 7E (roughly from Sault Ste. Marie southwards). Elsewhere, development in provincially significant wetlands is prohibited “unless it has been demonstrated that there will be no negative impacts on the natural features or their ecological functions.”<sup>221</sup> Certain types of land use, such as infrastructure development and works subject to Ontario’s Drainage Act, are explicitly exempt from *Provincial Policy Statement* requirements to protect wetlands.<sup>222</sup>

The question is whether and how the Ontario government’s wetland offsetting policy should address such differences in geography and land use. To begin, should all land uses negatively affecting wetlands be subject to offsetting requirements, and thus to a permitting process? Experiences in Alberta and Quebec are highly informative in this regard. In Alberta, only activities that result in permanent wetland losses require offsets, a parameter that exempts any project having a reclamation plan, regardless of the time frame for implementation. As well, even though the prohibition on wetland drainage applies to all, authorities in the past have been unable or unwilling to enforce it against the agricultural operators controlling the land where wetlands are located even though agricultural drainage has been one of the key drivers of wetland loss in southern and central Alberta. A study in the Beaverhill subwatershed of central Alberta showed that, between 1999 and 2009, “over 80% percent of wetland area losses occurred without government permits.”<sup>223</sup> Similarly, in the St. Lawrence lowlands of Quebec, a study of wetland disturbances from 2006 to 2011 revealed an enormous discrepancy between the wetland area covered by permits (500 hectares) and that actually disturbed (56,681 hectares). In the Quebec case, the two activities most responsible for wetland disturbance, agriculture and forestry, “were totally absent from the permitting procedure.”<sup>224</sup>

Historically, across Canada, drainage for agricultural purposes has been the greatest single threat to wetlands, “accounting for 85% of total known conversions.”<sup>225</sup> With respect to Ontario specifically, conversion of wetlands for agriculture accounted for 85 percent of wetland losses from 1967 to 1982.<sup>226</sup> Yet there appears to be little political appetite to deal with this driver of wetland loss. Although the Government of Ontario’s wetland conservation strategy proposes to “promote and expand opportunities to enhance wetland conservation and restoration through the Drainage Act,” there is no suggestion that drainage should be curtailed in any way or be subject to offsetting requirements.<sup>227</sup> In developing its wetland offsetting policy, the government can ill afford to ignore key causes of wetland loss if it hopes to reverse the ongoing trend of decline.

**Recommendation 9:** The wetland offsetting policy should apply across Ontario to all key drivers of wetland loss, including infrastructure development and drainage



works that are currently exempt from *Provincial Policy Statement* prohibitions.

**Recommendation 10:** The Government of Ontario should consult farmers and rural landowners to determine and address their unique challenges in preserving or restoring wetlands on their properties, and recognize both their interest in good stewardship and the beneficial role that they could play as offset providers for those who damage or destroy wetlands.

#### 4. Limits to offsetting

Appropriately, the Government of Ontario's wetland conservation strategy identifies setting limits to offsetting as a key consideration in the development of its wetland offsetting policy: "Some sites, features and habitats will be ineligible for offsetting based on their status (i.e., provincially significant wetlands, coastal wetlands protected by the PPS, 2014), their vulnerability, or their irreplaceability (i.e., bogs and fens)." <sup>228</sup> Since 1991, the government has aimed to prevent the loss of provincially significant wetlands, with an emphasis on southern Ontario, as noted above. <sup>229</sup> This clear commitment to maintain the current level of protection addresses one of the chief concerns raised during public consultations on the draft wetland conservation strategy (e.g., submission of Ontario Nature and 33 other organizations). <sup>230</sup> Indeed, setting limits to wetland offsetting has been a long-standing issue in Ontario. Pauline Lynch-Stewart notes that in 1991, the Canadian Environmental Law Association, the Federation of Ontario Naturalists (now Ontario Nature) and others expressed concern about "no net loss" being applied to provincially significant wetlands in a joint submission on the Ontario government's draft policy statement on wetlands. <sup>231</sup>

**Recommendation 11:** The wetland offsetting policy should ensure that provincially significant wetlands and significant coastal wetlands are strictly off limits to all forms of development, and that current protections under the *Provincial Policy Statement* and other provincial land use policies are upheld or strengthened.

Globally, the need to set limits to offsetting is widely recognized and supported across sectors. It is a key principle, for example, of the Business and Biodiversity Offsets Programme:

There are limits to what can be offset: There are situations where residual impacts cannot be fully compensated for by a biodiversity offset because of the irreplaceability or vulnerability of the biodiversity affected. <sup>232</sup>

Similarly, the IUCN explains in its 2016 policy on biodiversity offsets that,

in certain circumstances, residual impacts on biodiversity (after completing the avoidance, minimization and rehabilitation steps of the mitigation hierarchy) cannot be offset. Additionally, there are some components of biodiversity for which impacts could theoretically be offset, but with a high risk of failure. Under these circumstances, biodiversity offsets are not

appropriate, and this means the project as designed should not proceed.<sup>233</sup>

There is strong, widespread support for setting limits to offsetting in Ontario as well. At Ontario Nature's Biodiversity Offsetting Forum, held in May 2014, support for the following principle was almost unanimous:

Some sites, features and habitats should be off-limits to offsetting, based for example on vulnerability and irreplaceability. The "no-go" criteria should be informed by science and Aboriginal Traditional Knowledge.<sup>234</sup>

Similarly, members of Indigenous communities working with Ontario Nature drafted the following guiding principle on limits to offsetting, which emphasizes the need to consider cultural values and relationships with the land:

Some sites, features and habitats should be off-limits to offsetting, based for example on vulnerability, irreplaceability and their cultural significance for Indigenous peoples. In determining which sites should be off-limits to development, Indigenous knowledge and sound science must be considered and applied, according to protocols established by the community.

#### *Cultural Significance (Values)*

In determining limits to offsetting, cultural significance for Indigenous Peoples must be respected and determined on a community-by-community basis unless directed by the community otherwise. Cultural significance may include access by elders, hunting, fishing and gathering relationships, sacred sites, economic importance and ceremonial values, for example.

#### *Vulnerability*

In determining limits to offsetting, the vulnerability of the natural features or

### **Best Practice**

A strength of the New Brunswick government's wetland policy is its clear prohibition on development in provincially significant wetlands:

Government will not support proposed activities in a Provincially Significant Wetland, within 30 meters of the perimeter of a Provincially Significant Wetland, or any activity that poses substantial risk to a Provincially Significant Wetland except:

1. Activities that rehabilitate, restore, or enhance a Provincially Significant Wetland, or
2. Activities deemed to provide necessary public function, after completing an Environmental Impact Assessment with public review.<sup>237</sup>

systems affected must be taken into account. Vulnerability may also have to do with the vulnerability of community relationships with the features or systems involved, including the relationships of the knowledge keepers. Age, health, economics and the number of knowledge keepers all factor into these relationships and the risk that offsetting might sever or damage the relationships.

### *Irreplaceability*

Some types of natural features or systems cannot in any way be compensated for through offsetting. In such cases, the development proposal should not proceed.<sup>235</sup>

Several Canadian provinces have established limits to development that could negatively affect wetlands. Prohibitions on wetland development in New Brunswick and Nova Scotia are based, as in Ontario, on the concept of significance. The Government of Newfoundland and Labrador, however, takes a different approach, focusing on protecting water quantity and quality, hydrologic functions, and terrestrial and aquatic habitat of wetlands. Its approach prohibits development “within the recharge zones of domestic, municipal or private groundwater wells” and bans activities such as infilling, drainage, dredging and channelization that could “aggravate flooding problems or have unmitigatable adverse impacts.”<sup>236</sup>

The distinction the Government of Ontario makes between wetlands in the north and in the south is premised on regional differences in the historic level of wetland loss, an approach also reflected in the policies of the Governments of Nova Scotia and, historically, Alberta. In setting limits to offsetting, the Ontario government should likewise consider regional differences, though at a finer, watershed scale. Where wetland losses have been particularly acute, for example, in parts of southwestern and eastern Ontario and in the Niagara and Toronto areas,<sup>238</sup> remaining wetlands merit strict protection, especially given the inherent risks and uncertainties that offsetting entails. This would be in keeping with Canada’s federal wetland conservation policy, which has long recognized the need to prevent further loss of any remaining wetlands in areas where losses have been severe.<sup>239</sup>

Limits to offsetting should also take into account wetland type. Some wetlands, such as fens and bogs, are notoriously difficult if not impossible to restore.<sup>240</sup> The US National Research Council strongly recommends avoiding disturbance of fens and bogs.<sup>241</sup> Appropriately, as noted above, the government of Ontario’s wetland strategy mentions bog and fens as two types of wetlands that will be ineligible for offsetting due to their vulnerability or irreplaceability.

**Recommendation 12:** In setting limits to wetland offsetting, the Government of Ontario should take into account the type, location, vulnerability and irreplaceability of wetlands, as well as their cultural significance to Indigenous peoples. In so doing, it should consider levels of risk and historic loss.

## Limits to offsetting recommended by the IUCN

In its 2016 policy on biodiversity offsets, the IUCN recommends that, at a minimum, offsets not be used in the following situations:

- Where impacts are likely to lead to a high risk of driving one or more previously non-threatened species and/or ecosystems into the IUCN Red List Categories of Vulnerable, Endangered, Critically Endangered, Extinct in the Wild or Extinct, or driving one or more previously threatened species and/or ecosystems into IUCN Red List Categories of higher threat;
- Where the success of the offset action is highly uncertain due to a lack of knowledge;
- Where there is a substantial risk that investment generated by offsets might substitute for, rather than add to, other investment for conservation (e.g. “cost shifting”);
- Where the exchanges involved in the project’s residual losses and the predicted offset gains are considered socially or culturally unacceptable to relevant stakeholders;
- Where the values that will be lost are specific to a particular place, and therefore cannot be found elsewhere and adequately protected or re-created;
- Where the time lag between the residual loss of biodiversity caused by the project and the gains from the offset causes damage that cannot be remediated and/or puts biodiversity components at unacceptable risk;
- When impacts will occur in internationally and nationally recognized “no-go” areas such as impacts on natural or mixed World Heritage Sites and protected areas that are recognized as IUCN categories I, II, III, and IV, inter alia;
- When such action is considered incompatible with IUCN policy and Resolutions.<sup>242</sup>

## 5. Policy goal: net gain

A clearly stated and measurable policy goal is needed to direct successful implementation of wetland offsetting.<sup>243</sup> Often, as in the United States, Canada and New Brunswick, the goal is no net loss of wetland area and/or function.<sup>244</sup> The Government of Ontario’s wetland conservation strategy follows suit, with no net loss framing the offsetting discussion.<sup>245</sup> While the Nova Scotia government’s policy similarly establishes a goal of no net loss, it sets a higher goal of net gain for “wetland types that have experienced high historic losses.”<sup>246</sup>

Whether wetland policy needs to aim higher than no net loss, given historic losses to date, has long been a topic of policy discussions.<sup>247</sup> Dan Kraus of the Nature Conservancy of Canada makes a simple and compelling case for a more ambitious, net gain approach:

Why, in a country that has a long list of rare species and where habitats such as wetlands in southern Ontario and Quebec and BC, and native prairies are reduced to a small fraction of their former extent, would we want to legislate the status quo? If your money manager had been losing on your investments for 20 years, and then claimed a couple of years of breaking even as a success, it may certainly be an improvement, but still woefully lacking.<sup>248</sup>

There is strong support for a net gain approach to wetland offsetting in Ontario. At the October 2015 wetlands workshop that Ontario Nature and Ducks Unlimited Canada hosted, 91 percent of participants agreed that “policy for compensation/biodiversity

### **Preferred goal: net gain**

The international Business and Biodiversity Offsets Programme positions net gain as the preferred goal of offsets:

The goal of biodiversity offsets is to achieve no net loss and preferably a net gain of biodiversity on the ground with respect to species composition, habitat structure, ecosystem function and people’s use and cultural values associated with biodiversity.<sup>249</sup>

offsetting should require the achievement of a net gain in wetland habitat and function.” Indeed, broad support for net gain emerged from all discussions and workshops that Ontario Nature and partners have hosted since 2013.<sup>250</sup> Indigenous colleagues drafted the following guiding principle in support of net gain, highlighting the need to address cultural as well as ecological impacts:

Offsetting should require achievement of an overall net gain for biodiversity calculated on the basis of in situ (on-the-ground), measurable conservation outcomes for the Earth and all of its parts. If the proposed development negatively impacts cultural values, these impacts must also be offset on a net gain basis, according to protocols established by the community and in a culturally appropriate manner that satisfies community interests and needs.<sup>251</sup>

Given the historic and ongoing decline of wetlands, offsetting should be a positive force that does more than entrench the status quo. Offsetting should more than compensate for accepted losses that are part and parcel of offsetting trade-offs, taking into account

biodiversity, ecosystem function and Indigenous cultural values.

**Recommendation 13:** Ontario Nature recommends that the goal of the wetland offsetting policy be an overall net gain with respect to the extent and quality of wetland habitats, their functions and Indigenous cultural values.

## 6. Replacement (multiplier) ratios

The most common way of addressing risk and uncertainty in offsetting is to use replacement (multiplier) ratios based on an estimate of factors such as wetland value, probability of success, time lags and type of offset.<sup>252</sup> The jurisdictions reviewed above take a variety of approaches to setting the ratios:

- New Brunswick: The base ratio (wetland replaced:wetland lost) is 2:1, but, depending on the outcomes of an ongoing policy review, may rise to 4:1 in the near future; it is based on area affected.<sup>253</sup>
- Alberta: Ratios range from 8:1 to 1:8, based on the relative wetland values of the impact and replacements sites; a 1:1 ratio applies to “like for like” replacements.
- Saskatchewan: A previous ratio of 3:1 is being replaced by a customized calculation based on ecological value and function, taking into account such factors as local scarcity or loss, ecosystem services, number of wetlands affected, the impact on species of concern, and permanence. The type and permanence of the offset, as well as the level of risk, are also factored into the calculation.
- Nova Scotia: Ratios vary depending on the type of offset provided. A 2:1 ratio applies to wetland restoration or expansion, a 3:1 ratio to wetland enhancement (e.g. improving function) and a 4:1 ratio to wetland creation. The multiplier is based on the area of wetland affected.<sup>254</sup> It should be noted that many different types of actions may be included in the Nova Scotia government’s offset calculations, including some of questionable legitimacy, such as funding for research, the construction of interpretive centres and the publication of educational materials, none of which provides on-the-ground compensation for wetland loss.<sup>255</sup> Regardless of what is factored into the ratio, the required bottom line in that province is at least a 1:1 on-the-ground offset.

The problem with a 1:1 replacement ratio is that at best it entrenches the status quo. More likely, based on the US and Canadian experience to date, it will result in further wetland loss, especially if it fails to account for risk, uncertainty, time lags and the myriad wetland values at stake. Even if set by government as a minimum standard, a 1:1 ratio in practice sets a ceiling that may undermine efforts to negotiate a higher ratio. This was the experience of Bkejwanong First Nation, for example, when it attempted to negotiate a higher ratio for conservation offsets.<sup>256</sup>

If an offset project fails outright, of course, the proportions of the ratio do nothing to improve the outcome. Where total failure of the offset action is a possibility, failing totally on a much larger scale is hardly an attractive prospect. For this reason, policy must enable

regulators to refuse to authorize offsetting projects in situations where the offset is unlikely to be successful, or where levels of risk, uncertainty or time lags are too high.

**Recommendation 14:** The replacement ratio(s) for wetland offsets should be based on net gain, assuring that the tangible, on-the-ground benefits the offset provides exceed the corresponding losses (i.e., in area, function, Indigenous cultural values). The ratio(s) should reflect risk, uncertainty and time lags.

## 7. Establishing equivalence

Offsetting requires an ability to compare and equate gains and losses. In the world of carbon offsets, greenhouse gases represent a uniform, measurable and interchangeable commodity that can support trading. The situation is quite different, however, for conservation offsets generally and wetland offsets more specifically, given the variety and distinctness of species, habitats, ecological functions and associated cultural values. How to establish equivalence between a wetland lost and a wetland replaced has been a long-standing question in both the United States and Canada. In 1992, for example, Lynch-Stewart noted limitations in both the “ability to understand and assess wetland function” and the “capacity to restore or create wetlands.”<sup>257</sup>

The Ontario government’s wetland conservation strategy identifies the need to understand and establish equivalence, in terms of quantity (size), quality (function) and location of the offset.<sup>258</sup> The challenge will be to arrive at an acceptable and workable approach that prioritizes select features, functions and values without becoming hopelessly mired in expectations to measure and account for all of a wetland’s unique attributes and associated benefits:

The assessment of equivalency between the impact and offset is inherently problematic. The more one seeks to take into account the particular features of either site or activity, the further one strays from the commonalities that must underlie equivalency. If it is a difficult exercise in an individual case, it is even more difficult to establish a broadly applicable policy prescription.<sup>259</sup>

In establishing equivalence, the impacts and benefits must be measurable by a common medium of exchange, or “currency,” that can serve as a proxy for underlying values.<sup>260</sup> Easier said than done, the typical currency is, by default, the quantity (areal extent) of wetland habitat lost or replaced, which readily lends itself to objective measurement.<sup>261</sup> This is the approach, for example, in Alberta and Nova Scotia. International commentators, however, are critical of this currency.<sup>262</sup>

The need to incorporate a broader suite of values in establishing equivalence for offsets is widely recognized. In the United States, the offset currency is under further development, and efforts are being made to promote a hydrogeomorphic method that incorporates hydrological, biochemical and physical habitat considerations and measures.<sup>263</sup> Participants in Ontario Nature’s 2013 to 2014 meetings and workshops expressed strong agreement that in establishing equivalence the quality of the sites needs to be

considered.<sup>265</sup> Likewise, the following principle, which Indigenous colleagues drafted, acknowledges the inherent challenge of establishing equivalence and emphasizes the importance of factoring in cultural values and interests:

#### *Calculating equivalence*

In a fundamental sense, the destruction of a natural system or any of its components is never “equivalent” to their restoration elsewhere. Nevertheless, offsetting proceeds on the assumption that such trade-offs can be justified in some circumstances when they result in a net benefit for nature and communities. In establishing equivalence between the impacts and the offset, the offset must take into account not only quantity (size), but also quality with respect to the condition and biodiversity values of both the impact site and the offset site, as well as their landscape contexts. The full range of Indigenous cultural values and interests must be integrated into the determination of equivalence, according to protocols established by the community.<sup>266</sup>

#### **Consideration of full range of values**

In designing offsets, the international Business and Biodiversity Offsets Programme highlights the need to consider the biological, social and cultural values affected:

A biodiversity offset should be designed and implemented in a landscape context to achieve the expected measurable conservation outcomes taking into account available information on the full range of biological, social and cultural values of biodiversity, and supporting an ecosystem approach.<sup>264</sup>

Adequately capturing societal values related to wetlands and the benefits they provide will be difficult. According to Maron et al., “no currently used offsetting currency or biodiversity metric comes close to doing this.”<sup>267</sup>

**Recommendation 15:** The wetland offsetting policy should stipulate that in determining equivalence, wetland offsets must take into account the quantity (area) and quality of the wetland features and functions, their landscape context, and associated social and economic values. It should provide standards and criteria for assessing and comparing gains and losses.

## **8. Mitigation sequence**

The Government of Ontario’s proposed approach to offsetting, as presented in the wetland conservation strategy, is premised on the mitigation sequence and the primacy



of avoidance. It describes the sequence, appropriately, as “an expression of the value of leaving natural ecosystems intact and the risks and uncertainties inherent in human interventions aimed at minimizing disturbance and restoring, enhancing or constructing wetlands to create effective offsets.”<sup>268</sup>

Nationally and internationally, governments, conservationists and business leaders generally concur about the need to adhere to the mitigation sequence (hierarchy). Policies and principles of the Ramsar Convention, the IUCN and the Business and Biodiversity Offsets Programme all position offsetting as the third and final step in mitigation efforts, to be used only for impacts that cannot be avoided or minimized.<sup>269</sup>

Likewise, the United States and most of the Canadian jurisdictions reviewed above embrace the mitigation sequence, though to varying degrees. The Alberta government’s policy and mitigation directive stand out as a best practice. They stipulate that avoidance is the highest priority and require development proponents to demonstrate that they have made a concerted effort to avoid impacts and consider alternatives, including relocating or modifying the proposed activity. The mitigation directive also requires minimization of both direct and indirect impacts.<sup>270</sup>

Participants in Ontario Nature’s meetings and workshops have expressed very strong support for the mitigation sequence. For example, at the October 2015 wetlands workshop, 88 percent of participants agreed that offsetting “should be employed only as a final option within a clear mitigation hierarchy that prioritizes avoidance of impacts.” Indigenous colleagues drafted the following guiding principle, emphasizing the integration of Indigenous Traditional Knowledge into the sequence:

Offsetting should be set within a clear mitigation sequence, the first step being to define areas that are off limits to development and are to be protected from negative impacts as defined through both Indigenous Traditional Knowledge systems and sound Western science. The next step is to ensure that even where offsetting is allowed to occur, negative impacts are avoided wherever possible. Following this, any unavoidable negative impacts must be minimized. Offsetting then offers a means to deal with residual impacts that cannot be addressed through avoiding or minimizing harm. In implementing the mitigation sequence, Indigenous community protocols must be respected and used. Western science that is trusted by the community can be used.<sup>271</sup>

Even with almost universal acceptance of the mitigation sequence, it has proven difficult to implement in practice. According to Clare et al.,

there is broad agreement among scholars, scientists, policymakers, regulators, and the regulated community that the first and most important step in the mitigation sequence, avoidance, is ignored more often than it is implemented.<sup>272</sup>

Both the US and Canadian systems have been criticized for being too lax in promoting

avoidance.<sup>273</sup> One problem has been a lack of policy attention to the first two steps in the sequence: avoidance and mitigation. Hough and Robertson note, for example, that in the United States the focus of policy and guidance during the 1980s and 1990s was almost entirely on offsetting (compensation). In practice, “compensation” was treated as more or less synonymous with “mitigation,” offering a way for regulators to resolve tough permitting decisions<sup>274</sup> and “make it work” for the development proponent.<sup>275</sup>

Implementation of the mitigation sequence in Alberta has followed a similar trajectory, contend Clare et al., with a “pervasive tendency to skip over any serious consideration of wetland avoidance, and to instead move immediately to compensation for wetland loss.” As in the United States, clear guidance is lacking, and consequently permit decisions are “subject to a high degree of subjective interpretation.”<sup>276</sup>

In light of these problems, clear policy objectives and thresholds are needed to support implementation of the mitigation sequence in Ontario, including direction on the consideration of alternatives (alternative locations, designs, construction and operational techniques, on-site restoration methods, etc.) and monitoring and reporting requirements. Policy should enable and support an “active consideration of a ‘no project’ option,” as the Ramsar Scientific and Technical Review Panel notes.<sup>277</sup> The IUCN’s 2016 policy identifies several additional principles that should guide application of the mitigation sequence (see textbox “IUCN 2016 Policy”).

**Recommendation 16:** The wetland offsetting policy should position offsetting as the last step within a clear mitigation sequence, the first step and highest priority being to avoid negative impacts. Following this, any unavoidable negative impacts should be minimized to the extent possible. Offsetting, the final step, then offers a means to deal with residual impacts that cannot be addressed through avoidance or minimizing harm.

**Recommendation 17:** The wetland offsetting policy should define thresholds to be met for avoidance and minimization of adverse impacts, and include the consideration of alternatives. It should require development proponents to document all measures taken to meet the thresholds. It should also require regulators to carry out their own assessments of proponents’ efforts to avoid and minimize impacts. Where efforts have been insufficient, the policy should direct regulators to refuse to grant authorizations for proposed developments.

**Recommendation 18:** The wetland offsetting policy should set out requirements for the consultation and engagement of Indigenous communities at each step of the mitigation sequence (with respect for Constitutional obligations, applicable land use policies and standards established in the United Nations Declaration on the Rights of Indigenous Peoples) and for the application of Indigenous Traditional Knowledge systems.

## **IUCN 2016 Policy**

An appropriate application of the mitigation hierarchy must follow at a minimum the following fundamental principles:

1. Be applied as early as possible in the project life cycle, to inform potential development decisions.
2. Explicitly consider the project within a broader landscape or seascape context.
3. Identify and respect nationally and internationally recognized “no-go” areas.
4. Thoroughly examine lower impact alternatives in the project design, including not proceeding with the project at all, recognising that not all impacts can be offset to achieve No Net Loss.
5. Give priority to avoiding any damage to biodiversity.
6. Take full account of direct, indirect and cumulative impacts, geographically and over time.
7. Clearly distinguish impact avoidance, minimisation and on-site restoration measures from offsets.
8. Design offsets to achieve at least No Net Loss and preferably a Net Gain of biodiversity.
9. Ensure any biodiversity offsets used as part of the mitigation hierarchy secure additional conservation outcomes that would not have happened otherwise.
10. Use approaches that are science-based, transparent, participatory, and address the effects of the project and mitigation actions on livelihoods.
11. Follow a Rights-based Approach, as defined by IUCN resolution WCC-2012-Res-099.
12. Identify and put in place the legal, institutional and financial measures needed to ensure long-term governance of all mitigation actions (including any biodiversity offsets).
13. Apply a rigorous monitoring, evaluation and enforcement system that includes independent verification of all mitigation actions.
14. Apply the Precautionary principle throughout all stages of the mitigation hierarchy.
15. Apply the Ecosystem approach in all stages of the mitigation hierarchy.<sup>278</sup>

## 9. Location of offsets

The Government of Ontario's wetland strategy recognizes that the location of the wetland offset, including its proximity to the impact site, needs to be a key consideration in the development of offsetting policy. The draft suggests overarching regional parameters, noting that "losses in the south should not be compensated for by gains in the north."<sup>279</sup> In further defining an appropriate approach to locating offsets, the government will need to set the stage to achieve desired conservation outcomes, while dealing fairly and equitably with affected communities.

From a community perspective, it generally makes sense to locate the replacement wetland close to the impact site so that community members maintain access to a wetland and the benefits it provides. Such an approach may or may not deliver optimal conservation outcomes, however, depending on the availability of suitable sites. The US experience with wetland offsetting is informative in this regard. According to the National Research Council,

the ability to achieve desired outcomes within a specific location is also a function of the degree of degradation of the hydrological conditions, soils, vegetation, and fauna at the site. The more degraded the local site and the more degraded the watershed, the less likely it will support a high-quality project. Thus, opportunities for in-kind compensation need to be sought within a larger landscape context.<sup>280</sup>

The council recommended that site selection be conducted on a watershed scale "in order to maintain wetland diversity, connectivity, and appropriate proportions of upland and wetland systems needed to enhance the long-term stability of the wetland and riparian systems."<sup>281</sup> This advice aligns with an international trend, identified by Bruce A. McKenney and Joseph M. Kiesecker: offsetting policy is moving away from strict requirements to locate the offset as close as possible to the impact site; instead, the offset location is generally being determined according to the landscape context (e.g., same watershed, same bioregion) and conservation outcome.<sup>282</sup>

This trend is exemplified in the Government of Alberta's Relative Wetland Value Assessment Units, based generally on the boundaries of watersheds and natural regions (see Figure 1, page 15). Even within this landscape-based approach, however, the Alberta government has managed to prioritize proximity of the offset to the impact site, favouring wetland replacement within the same municipality over wetland replacement within larger geographic boundaries.<sup>283</sup> This innovative approach should help to ensure that the affected community does not lose out on the many benefits the wetland provides.

There is broad agreement that conservation offsetting should result in an equitable distribution of social costs and benefits,<sup>284</sup> a matter of direct relevance to the siting of replacement wetlands. The following principle, which Indigenous colleagues drafted, embraces this perspective, as well as the need to consider long-term conservation outcomes:

The offset location should be based on desired biodiversity conservation outcomes and cultural values including the potential for long-term success and viability. The offset agreement should include ecological and cultural capacity benefits to communities that are negatively impacted by the development, especially if the offset location is not close to the disturbed site.<sup>285</sup>

The Government of Ontario's wetland offsetting policy should aim to achieve these outcomes, which will align well with its proposal to incorporate wetland protection and restoration into local and watershed planning.<sup>286</sup> Given the significant ecological, social and economic benefits of wetlands, including their importance in storing and purifying water and attenuating the negative impacts of climate change, policy should ensure that offset sites are located within the same catchment or subwatershed as the impact sites.

**Recommendation 19:** The wetland offsetting policy should outline an approach to siting offsets based on a consideration of the landscape context, desired conservation outcomes, Indigenous cultural values, the potential for long-term success and viability, and the equitable distribution of social costs and benefits.

## 10. Duration of offsets

Determining the duration of wetland offsets is to be a key consideration in the Government of Ontario's wetland offsetting policy: "This may be based on the duration of the negative impacts of the development project or require wetlands to be secured in perpetuity."<sup>287</sup> Internationally, there is broad agreement that the outcomes secured through an offset should "last at least as long as the project's impacts and ideally in perpetuity."<sup>288</sup> Participants in Ontario Nature's meetings and workshops have likewise expressed strong support for this principle,<sup>289</sup> though Indigenous colleagues have proposed a higher standard, more reflective of a net gain approach, whereby "at least as long" would not be deemed sufficient:

The beneficial outcomes secured through an offset should extend beyond the project's impacts, and ideally should last in perpetuity. Impacts to be considered include harm to biodiversity as well as harm to Indigenous cultural values and interests.<sup>290</sup>

There is a range of approaches to this issue among the jurisdictions reviewed above. In Nova Scotia, for example, offsets are considered permanent: approvals for development are not allowed in wetlands that have been restored or created for compensation purposes.<sup>291</sup> In contrast, the Alberta government's emerging approach does not even require offsets to last as long as the adverse impacts, as long as the impact to the offsets is itself offset.

In developing policy regarding the duration of wetland offsets, three issues must be addressed. First, in situations where development impacts would not be permanent,

it would be reasonable to contemplate temporary offsets. Yet defining which types of impacts would be deemed to be “temporary” and what sort of time scale would apply is bound to be controversial. While housing or infrastructure development would probably be seen to have permanent impacts, the same may not be true for aggregates extraction or oil and gas development.

Second, expectations that offsets must be permanent could limit the involvement of farmers and other landowners as offset providers.<sup>292</sup> Noga and Adamowicz point out, for example, that “landowners prefer short term contracts to allow them to react to changing land and crop prices.”<sup>293</sup>

In light of this issue, Ontario’s Bobolink Round Table advised the government to consider some degree of “portability” of offsets whereby offset sites could move geographically through time “as long as the agreed-upon total combined number of acres remains the same.”<sup>294</sup>

The third issue has to do with time lags between the occurrence of the impact and the full achievement of the offset gains.<sup>295</sup> Given risks and time delays, the IUCN recommends that “where possible, the offset should be in place before the impact occurs.”<sup>296</sup>

**Recommendation 20:** Policy for wetland offsetting should ensure that offsets are designed, both technically and legally, to last in perpetuity, or at least as long as the project’s adverse impacts. To deal with time lags between the impact occurring and the full achievement of the offset gains, where possible the offset should be in place before the impact occurs.

## 11. Wetland protection or averted loss

Wetland offsetting may take a variety of forms, including wetland restoration, creation, enhancement or protection. In many of the jurisdictions reviewed above, protection of an existing wetland – often referred to as “averted loss” – is seen as the least preferred option, as it does not result in a tangible gain in wetland area or function. This is the case in the United States, for example, where several conditions apply to the use of averted loss as an offset: there must be an existing threat to the wetland; the protected site must provide important physical, chemical or biological functions for the watershed; a district engineer must determine its appropriateness and practicability; and an appropriate legal instrument must be used to protect it.<sup>297</sup> In the US and Nova Scotia approaches, as well as in the Saskatchewan government’s planned approach, the calculation of the offset reflects the type of compensation offered, valuing approaches that restore or reclaim wetland habitat more highly than those that protect existing wetlands. Approvals for averted loss offsets in both the United States and Nova Scotia typically require restoration or enhancement efforts in addition to protecting the site.

A basic premise of offsetting is the concept of additionality. Simply put, for an action to count as an offset, the gains must be additional to those that would have occurred if there had not been an offset.<sup>298</sup> The rationale for including averted loss in offset calculations

is that it provides additional security to a vulnerable site. Thus, a consideration of future threats to the wetland, as well as current or anticipated restrictions on the use of the site (e.g., commitments to protecting it as a provincially significant wetland, as part of a natural heritage system or as a candidate protected area), is integral to determining additionality. Maron et al. explain:

Only biodiversity benefits that are additional to a baseline scenario (what would have happened without the impact or the offset) count as valid offsets. The baseline scenario must reflect both probable future threats and any genuine future intentions to redress those threats. Too many schemes overlook the latter.<sup>299</sup>

An underlying premise of this report is that the Government of Ontario's wetland conservation strategy will prioritize the conservation of existing wetlands, and that current policy protections for significant wetlands will be upheld. This baseline scenario would, from the outset, substantially limit the circumstances in which offsetting of any type would be available and in which averted loss, more specifically, would be considered an additional gain.

**Recommendation 21:** Averted wetland loss should be considered a valid offset only where it is demonstrated that securement of the wetland provides additional benefits to the baseline scenario, taking into consideration probable future threats and current or anticipated restrictions on the use of the site.

## 12. Conservation banking

Conservation (“mitigation”) banks have been used in the United States since the 1980s and are widely understood to address many of the limitations of on-site or single-project offsets, as discussed above. Gardner explains that “the core concept of mitigation banking is advance mitigation – the mitigation project is provided or begins in advance of the development project.”<sup>300</sup> Banking offers a higher level of scrutiny, improved likelihood of success, lower cost and relief from liability for the permittee, and easier monitoring for regulators.<sup>301</sup> In Canada, however, conservation banking is limited to non-existent, depending on the jurisdiction. The Alberta Wetland Mitigation Directive introduces wetland banking as an option, and the New Brunswick government's draft protocols likewise provide for banking, though neither province has developed an operational banking system at present. The Saskatchewan government is considering the opportunity.

In Ontario, conservation banking is already occurring to a limited degree, though provincial law and policy do not address it. At the 2016 workshop on conservation banking hosted by Ontario Nature and the Toronto and Region Conservation Authority, participants from multiple organizations (conservation authorities, municipalities, government and non-governmental organizations, industry and consultants) indicated that they had used a form of conservation banking. It should be noted, however, that the topic was controversial; 69 percent of participants expressed support for conservation banking.<sup>302</sup>

A key decision for the Ontario government will be whether to include banking in its wetland offsetting policy. Should the government decide to proceed, it must be prepared to play a key role in the banking system, creating demand for credits by imposing offsetting requirements on authorized activities and regulating supply by authorizing and overseeing mitigation banks. As Gardner notes, “the purchase of a mitigation credit, without government approval, is worthless to the permittee.”<sup>303</sup> In the United States, the number of banks increased dramatically after the issuance of the 1995 Banking Guidance, which enhanced confidence about the stability of the system and the potential to make profit. As of 2005, about 78 percent of the wetland banks in the United States were for-profit ventures.<sup>304</sup>

**Recommendation 22:** The Government of Ontario should carefully examine and provide direction on wetland banking, with input from Indigenous communities, municipalities and stakeholders. If it decides to enable conservation banking, it must address such issues as governance, oversight, limits to offsetting, equivalence, and equitable distribution of costs and benefits among affected communities.



# E. Conclusion and summary of recommendations

---

The Government of Ontario is well positioned to develop an effective, precedent-setting wetlands offsetting policy. It can build on decades of experience in the United States, Canada and Alberta, as well as ongoing efforts by the governments of provinces such as New Brunswick, Nova Scotia and Saskatchewan to grapple with key challenges. The Ontario government can also leverage the interest across sectors for an approach to offsetting that addresses inconsistencies, provides clarity and transparency, and positively influences development decisions by integrating the true environmental and social costs of wetland loss.

Wetland offsetting offers a middle ground between allowing development to proceed without compensation, as is often the case in Ontario, and stopping all development that negatively affects wetlands, which is not, at least currently, a realistic expectation. But policy-makers must find ways to address the well-founded skepticism and widespread concern that loose application of offsetting will open the door to increased destruction of wetlands.<sup>305</sup> The trade-offs inherent in offsetting will be acceptable to the public only if wetlands, and the communities that benefit from them, are better off in the end.

In-depth assessments of wetland offsetting experiences to date show success will depend on clear rules and standards, reliable record keeping, and the political will and capacity to monitor and enforce compliance. It's that simple – which is not to say that it's easy. The summary of recommendations below, based on lessons learned in the United States and across Canada, provide guidance on the key policy issues.

## **Summary of recommendations:**

1. The Government of Ontario's wetland offsetting policy should outline the provincial government's role and responsibilities in developing guidance, protocols and performance standards; setting up and managing reliable, publicly accessible information systems; authorizing and recording offsetting transactions; and monitoring and enforcing compliance.
2. The wetland offsetting policy should set clear, measurable performance standards to ensure consistency in program implementation and enable evaluation of program outcomes.
3. The Government of Ontario should commit to providing sufficient funds and expertise to effectively administer and oversee the wetlands offsetting program.
4. The administrative and oversight roles of government with respect to wetland offsetting should be kept distinctly separate and assigned to different government agencies.

5. The Government of Ontario should assign an independent body, such as the Environmental Commissioner of Ontario or a standing committee of experts and stakeholders, to provide regular, periodic review and evaluation of the wetland offsetting program.
6. The wetland offsetting policy should explicitly state that it is to be implemented in a manner that is consistent with the recognition and affirmation of existing Aboriginal and treaty rights in section 35 of the Constitution Act, 1982. It should also clearly indicate how the Crown's duty to consult is to be delegated to third parties, such as municipalities.
7. Ontario Nature recommends that the wetland offsetting policy recognize the right of Indigenous peoples to free, prior and informed consent, and provide relevant guidance.
8. The Government of Ontario should commit to investing the funds and resources needed to positively and proactively engage affected Indigenous communities and knowledge keepers in wetland offsetting planning and decisions.
9. The wetland offsetting policy should apply across Ontario to all key drivers of wetland loss, including infrastructure development and drainage works that are currently exempt from *Provincial Policy Statement* prohibitions.
10. The Government of Ontario should consult farmers and rural landowners to determine and address their unique challenges in preserving or restoring wetlands on their properties, and recognize both their interest in good stewardship and the beneficial role that they could play as offset providers for those who damage or destroy wetlands.
11. The wetland offsetting policy should ensure that provincially significant wetlands and significant coastal wetlands are strictly off limits to all forms of development, and that current protections under the *Provincial Policy Statement* and other provincial land use policies are upheld or strengthened.
12. In setting limits to wetland offsetting, the Government of Ontario should take into account the type, location, vulnerability and irreplaceability of wetlands, as well as their cultural significance to Indigenous peoples. In so doing, it should consider levels of risk and historic loss.
13. Ontario Nature recommends that the goal of the wetland offsetting policy be an overall net gain with respect to the extent and quality of wetland habitats, their functions and Indigenous cultural values.
14. The replacement ratio(s) for wetland offsets should be based on net gain, assuring that the tangible, on-the-ground benefits the offset provides exceed the corresponding losses (i.e., in area, function, Indigenous cultural values). The ratio(s) should reflect risk, uncertainty and time lags.
15. The wetland offsetting policy should stipulate that in determining equivalence, wetland

offsets must take into account the quantity (area) and quality of the wetland features and functions, their landscape context, and associated social and economic values. It should provide standards and criteria for assessing and comparing gains and losses.

16. The wetland offsetting policy should position offsetting as the last step within a clear mitigation sequence, the first step and highest priority being to avoid negative impacts. Following this, any unavoidable negative impacts should be minimized to the extent possible. Offsetting, the final step, then offers a means to deal with residual impacts that cannot be addressed through avoidance or minimizing harm.
17. The wetland offsetting policy should define thresholds to be met for avoidance and minimization of adverse impacts, and include the consideration of alternatives. It should require development proponents to document all measures taken to meet the thresholds. It should also require regulators to carry out their own assessments of proponents' efforts to avoid and minimize impacts. Where efforts have been insufficient, the policy should direct regulators to refuse to grant authorizations for proposed developments.
18. The wetland offsetting policy should set out requirements for the consultation and engagement of Indigenous communities at each step of the mitigation sequence (with respect for Constitutional obligations, applicable land use policies and standards established in the United Nations Declaration on the Rights of Indigenous Peoples) and for the application of Indigenous Traditional Knowledge systems.
19. The wetland offsetting policy should outline an approach to siting offsets based on a consideration of the landscape context, desired conservation outcomes, Indigenous cultural values, the potential for long-term success and viability, and the equitable distribution of social costs and benefits.
20. Policy for wetland offsetting should ensure that offsets are designed, both technically and legally, to last in perpetuity, or at least as long as the project's adverse impacts. To deal with time lags between the impact occurring and the full achievement of the offset gains, where possible the offset should be in place before the impact occurs.
21. Averted wetland loss should be considered a valid offset only where it is demonstrated that securement of the wetland provides additional benefits to the baseline scenario, taking into consideration probable future threats and current or anticipated restrictions on the use of the site.
22. The Government of Ontario should carefully examine and provide direction on wetland banking, with input from Indigenous communities, municipalities and stakeholders. If it decides to enable conservation banking, it must address such issues as governance, oversight, limits to offsetting, equivalence, and equitable distribution of costs and benefits among affected communities.

## Endnotes

- <sup>1</sup> Ontario Ministry of Natural Resources and Forestry (MNRF), *A Wetland Conservation Strategy for Ontario 2017-2030* (2017), 39. [apps.mnr.gov.on.ca/public/files/er/a-wetland-conservation-strategy-for-ontario-2017-2030.pdf](https://apps.mnr.gov.on.ca/public/files/er/a-wetland-conservation-strategy-for-ontario-2017-2030.pdf).
- <sup>2</sup> Conservation offsets impose on developers the cost of their environmental footprint. See D. Poulton, *Key Issues in Biodiversity Offset Law and Policy: A Comparison of Six Jurisdictions* (Toronto: Ontario Nature, June 2015), 4. [ontarionature.org/protect/habitat/PDFs/Key\\_Issues\\_In\\_Biodiversity\\_Offset\\_Law\\_and\\_Policy\\_A\\_Comparison\\_of\\_Six\\_Jurisdictions\\_Final.pdf](https://ontarionature.org/protect/habitat/PDFs/Key_Issues_In_Biodiversity_Offset_Law_and_Policy_A_Comparison_of_Six_Jurisdictions_Final.pdf).
- <sup>3</sup> R.C. Gardner, "Rehabilitating Nature: A Comparative Review of Legal Mechanisms That Encourage Wetland Restoration Efforts," *Catholic University Law Review*, 52:3 (Spring, 2003), 610.
- <sup>4</sup> Presentations from G. Radford and J. Tolisano at the Biodiversity Offsets in Canada Conference (Ottawa: February 2014).
- <sup>5</sup> National Research Council, *Compensating for Wetland Losses Under the Clean Water Act* (Washington DC: National Academy Press, 2001), 2. [nap.edu/read/10134/chapter/1](https://nap.edu/read/10134/chapter/1).
- <sup>6</sup> Gardner, 2003, 614.
- <sup>7</sup> D. Moreno-Mateos, M.E. Power, F.A. Comin and R. Yockteng, "Structural and functional loss in restored wetland ecosystems," *PLOS Biology*, 10(1), e1001247 (2012), 6.
- <sup>8</sup> For more information on this workshop, see Ontario Nature, *Biodiversity Offsetting in Ontario: Issues, Accomplishments and Future Directions – Summary of Ontario Nature's 2014–2016 Project* (Toronto, 2016), 10. [ontarionature.org/discover/resources/PDFs/reports/Biodiversity\\_Offsetting\\_in\\_Ontario\\_Summary%20of\\_Ontario\\_Nature's\\_2014-2016\\_Project\\_Report.pdf](https://ontarionature.org/discover/resources/PDFs/reports/Biodiversity_Offsetting_in_Ontario_Summary%20of_Ontario_Nature's_2014-2016_Project_Report.pdf).
- <sup>9</sup> International Union for the Conservation of Nature (IUCN) (2014). *Biodiversity Offsets Technical Study Paper* (Gland, Switzerland: IUCN), 2. [cmsdata.iucn.org/downloads/final\\_biodiversity\\_offsets\\_paper\\_9nov2014\\_1.pdf](https://cmsdata.iucn.org/downloads/final_biodiversity_offsets_paper_9nov2014_1.pdf).
- <sup>10</sup> International Union for the Conservation of Nature (IUCN), *IUCN Policy on Biodiversity Offsets* (January 29, 2016), 3. [cmsdata.iucn.org/downloads/iucn\\_biodiversity\\_offsets\\_policy\\_jan\\_29\\_2016.pdf](https://cmsdata.iucn.org/downloads/iucn_biodiversity_offsets_policy_jan_29_2016.pdf).
- <sup>11</sup> MNRF, 2017, 6.
- <sup>12</sup> Austin Troy and Ken Bagstad, *Estimating Ecosystem Services in Southern Ontario*, Report prepared for the Ontario Ministry of Natural Resources (Pleasanton, CA: Spatial Informatics Group, 2009), Table 4, 18.
- <sup>13</sup> Troy and Bagstad, Table 3, 14.
- <sup>14</sup> David Schindler and Jim Bruce, "Freshwater Resources," *Climate Change Adaptation: A Priorities Plan for Canada*, Report of the Climate Change Adaptation Project (Canada), Blair Feltmate and Jason Thistlewaite (Intact Insurance and University of Waterloo, June 2012): 10; see also 57-58. [uwaterloo.ca/environment/sites/ca.environment/files/uploads/files/CCAP-Report-30May-Final.pdf](https://uwaterloo.ca/environment/sites/ca.environment/files/uploads/files/CCAP-Report-30May-Final.pdf).
- <sup>15</sup> See MNRF, 2017, 11–19, regarding policies, programs and partnerships.
- <sup>16</sup> Anne Bell, "Drawing a line to protect the few remaining wetlands in Niagara." (February 2, 2016). [ontarionature.org/connect/blog/?s=Niagara](https://ontarionature.org/connect/blog/?s=Niagara).
- <sup>17</sup> Jack Gibbons, "Municipal politics all wet when it comes to wetlands." (October 6, 2016). [ontarionature.org/connect/blog/municipal-politics-all-wet-when-it-comes-to-wetlands/#more-4819](https://ontarionature.org/connect/blog/municipal-politics-all-wet-when-it-comes-to-wetlands/#more-4819).
- <sup>18</sup> Ducks Unlimited Canada, "Coastal Wetland Status and Trends: Project Summary" (2015). According to the analysis, much of this loss is a result of development for infrastructure, industry and recreation (marinas), residential development and agricultural practices.
- <sup>19</sup> Ontario Premier Kathleen Wynne pledged to reverse wetland loss in Ontario by 2025 (open letter to Ducks Unlimited Canada, June 9, 2014). [ducks.ca/assets/2012/06/Liberal-Party-Response.pdf](https://ducks.ca/assets/2012/06/Liberal-Party-Response.pdf).
- <sup>20</sup> As noted in MNRF, 2017, 42.
- <sup>21</sup> Ontario Nature, *Insights into Biodiversity Offsetting in Ontario: Summary of Ontario Nature's 2013–2014 Project*. Ontario Nature: Toronto, 2014. [ontarionature.org/discover/resources/PDFs/reports/Biodiversity\\_Offsetting\\_Ontario.pdf](https://ontarionature.org/discover/resources/PDFs/reports/Biodiversity_Offsetting_Ontario.pdf).
- <sup>22</sup> Poulton, June 2015.
- <sup>23</sup> Ontario Nature, 2016.
- <sup>24</sup> Larry McDermott and Anne Bell, *Indigenous Perspectives on Conservation Offsetting: Five Case Studies from Ontario, Canada*, Toronto: Ontario Nature, Plenty Canada and the Indigenous Environmental Studies and Sciences Program at Trent University, 2017. [ontarionature.org/protect/habitat/PDFs/Indigenous%20Perspectives%20on%20Conservation%20Offsetting%20final\\_796kb.pdf](https://ontarionature.org/protect/habitat/PDFs/Indigenous%20Perspectives%20on%20Conservation%20Offsetting%20final_796kb.pdf).
- <sup>25</sup> National Research Council.
- <sup>26</sup> Environmental Protection Agency (EPA), the Army Corps of Engineers, and the Departments of Agriculture, Commerce, Interior, and Transportation, National Wetlands Mitigation Action Plan factsheet, 2. [epa.gov/](https://epa.gov/)

- [sites/production/files/2015-08/documents/national\\_wetlands\\_mitigation\\_action\\_plan\\_factsheet\\_0.pdf](https://www.epa.gov/sites/production/files/2015-08/documents/national_wetlands_mitigation_action_plan_factsheet_0.pdf).
- <sup>27</sup> Clean Water Act, 33 USC 1251.
- <sup>28</sup> Compensatory Mitigation for Losses of Aquatic Resources – Final Rule, 33 CFR § 325, § 332, 40 CFR § 230; Guidelines, 55 Fed. Reg. 9210, 9211 (1990).
- <sup>29</sup> For a more detailed explanation, see Poulton, June 2015, 26–29.
- <sup>30</sup> Water Resources Development Act, 33 USC § 2317(a)(1) (The Water Resources Development Act of 1990).
- <sup>31</sup> This alignment of interests and its potential consequences are discussed in James Salzman and J.B. Ruhl, “Currencies and the Commodification of Environmental Law,” *Stanford Law Review* 53:3 (2000), 607. On the general relationship and respective duties of the Environmental Protection Agency and the US Army Corps of Engineers, see Royal C. Gardner, *Lawyers, Swamps and Money: U.S. Wetland Law, Policy and Politics* (Washington, DC: Island Press, 2011), 73–92.
- <sup>32</sup> 33 CFR § 332.2.
- <sup>33</sup> Environmental Protection Agency (EPA), Wetlands Compensatory Mitigation, 1. [epa.gov/sites/production/files/2015-08/documents/compensatory\\_mitigation\\_factsheet.pdf](https://www.epa.gov/sites/production/files/2015-08/documents/compensatory_mitigation_factsheet.pdf).
- <sup>34</sup> Marianne Darbi, Alfred Herberg, Holger Ohlenburg and Wolfgang Wende, *Impact Mitigation and Biodiversity Offsets – Compensation Approaches from Around the World* (Bonn: Federal Agency for Nature Conservation, 2010); Economics for the Environment Consultancy and the Institute for European Environmental Policy, *The Use of Market-Based Instruments for Biodiversity Protection – The Case of Habitat Banking: Summary Report for the European DG Environment* (London: Eftec), [ec.europa.eu/environment/enveco/index.htm](http://ec.europa.eu/environment/enveco/index.htm); Bruce A. McKenney and Joseph M. Kiesecker (2010), “Policy Development for Biodiversity Offsets: A Review of Offset Frameworks” *Environmental Management* 45, 165; Business and Biodiversity Offset Programme (BBOP 2013), *To No Net Loss and Beyond: an Overview of the Business and Biodiversity Offsets Programme* (Washington, DC: Forest Trends, 2013), [forest-trends.org/documents/files/doc\\_3319.pdf](http://forest-trends.org/documents/files/doc_3319.pdf); Joseph W. Bull, K. Blake Suttle, Ascelin Gordon, Navinder J. Singh and E.J. Milner-Gulland (2013), “Biodiversity Offsets in Theory and Practice,” *Fauna and Flora International, Oryx* 1, [forest-trends.org/documents/files/doc\\_3908.pdf](http://forest-trends.org/documents/files/doc_3908.pdf); Cross-Sector Biodiversity Initiative (CSBI 2015) and The Biodiversity Consultancy, “A Cross-Sector Guide for Implementing the Mitigation Hierarchy” (Cambridge, UK: Cross-Sector Biodiversity Initiative, 2015), [csbi.org.uk/wp-content/uploads/2015/09/CSBI-Mitigation-Hierarchy-Guide-Sept-2015-1.pdf](http://csbi.org.uk/wp-content/uploads/2015/09/CSBI-Mitigation-Hierarchy-Guide-Sept-2015-1.pdf); Poulton, June 2015.
- <sup>35</sup> EPA, 1. According to the National Research Council, preservation is allowed in “exceptional cases” only (2).
- <sup>36</sup> EPA, Wetlands Compensatory Mitigation, 2; EPA, “Mitigation Banking Factsheet,” [epa.gov/cwa-404/mitigation-banking-factsheet](https://www.epa.gov/cwa-404/mitigation-banking-factsheet).
- <sup>37</sup> EPA, “Mitigation Banking Factsheet.”
- <sup>38</sup> EPA, “Mitigation Banking Factsheet.”
- <sup>39</sup> Celine Jeandel and Delphine Morandeau, “Compensating for damage to biodiversity: the American experience of wetlands banks,” *Le Point Sur*, No. 134 (August 2012). [developpement-durable.gouv.fr/IMG/pdf/LPS134EN-2.pdf](http://developpement-durable.gouv.fr/IMG/pdf/LPS134EN-2.pdf).
- <sup>40</sup> EPA, Wetlands Compensatory Mitigation, 1; EPA, “Mitigation Banking Factsheet”; Ontario Nature, 2016, 44–45; Gardner, 2003, 615–618.
- <sup>41</sup> Jeandel and Morandeau, 2.
- <sup>42</sup> Poulton, June 2015, 28.
- <sup>43</sup> Poulton, June 2015, 28.
- <sup>44</sup> National Research Council, 2.
- <sup>45</sup> D.J. Harper and J.T. Quigley, “No Net Loss of Fish Habitat: A Review and Analysis of Habitat Compensation in Canada” (2005) *Environmental Management* 36:3, 343; David W. Poulton, “Offsetting for ‘Serious Harm’: The Recent Evolution of Section 35 of the Fisheries Act, 1985” (2016) 29, *Journal of Environmental Law and Practice*, 19; National Research Council, 3, 7, 138.
- <sup>46</sup> National Research Council, 3.
- <sup>47</sup> National Research Council, 4, 141–145.
- <sup>48</sup> National Research Council, 129.
- <sup>49</sup> Palmer Hough and Morgan Robertson, “Mitigation under Section 404 of the Clean Water Act: where it comes from, what it means,” *Wetlands Ecology and Management* (2009), 27. [academia.edu/2130728/Mitigation\\_under\\_Section\\_404\\_of\\_the\\_Clean\\_Water\\_Act\\_where\\_it\\_comes\\_from\\_what\\_it\\_means](http://academia.edu/2130728/Mitigation_under_Section_404_of_the_Clean_Water_Act_where_it_comes_from_what_it_means).
- <sup>50</sup> Hough and Robertson, 28.
- <sup>51</sup> Hough and Robertson, 27.
- <sup>52</sup> Shari Clare, Naomi Krogman, Lee Foote and Nathan Lemphers, “Where is the avoidance in the implementation of wetland law and policy?” *Wetlands Ecology and Management* 19 (2011), 165. [cbd.int/](http://cbd.int/)

[financial/doc/ifrik-innovative-financial-mechanisms-02-2011-en.pdf](#).

- <sup>53</sup> National Research Council, 156–157.
- <sup>54</sup> EPA et al., 2.
- <sup>55</sup> “The Transportation Equity Act for the 21st Century (TEA-21) authorizes over \$200 billion to improve the Nation’s transportation infrastructure, enhance economic growth and protect the environment. TEA-21 creates new opportunities to improve air and water quality, restore wetlands and natural habitat, and rejuvenate urban areas through transportation redevelopment, increased transit and sustainable alternatives to urban sprawl.” [epa.gov/cwa-404/overview-what-tea-21](#).
- <sup>56</sup> Government of Canada, *The Federal Policy on Wetland Conservation*, Ottawa, 1991. [nawcc.wetlandnetwork.ca/Federal%20Policy%20on%20Wetland%20Conservation.pdf](#).
- <sup>57</sup> Fisheries Act, RSC 1985, c. F-14.
- <sup>58</sup> Pauline Lynch-Stewart, *No Net Loss: Implementing “No Net Loss” Goals to Conserve Wetlands in Canada*, Issues Paper, No. 1992-2 (Ottawa: North American Wetlands Conservation Council (Canada), 1992), iv. [nawcc.wetlandnetwork.ca/No%20Net%20Loss%201992-2.pdf](#).
- <sup>59</sup> Fisheries and Oceans Canada, *The Department of Fisheries and Oceans Policy for the Management of Fish Habitat* (Ottawa, 1986), [dfo-mpo.gc.ca/Library/23654.pdf](#); Environment Canada, Operational Framework on the Use of Conservation Allowances (Ottawa: Environment Canada, 2012), [ec.gc.ca/ee-ea/default.asp?lang=En&n=DAB7DD13-1](#); see Poulton, 2016, 27.
- <sup>60</sup> Ramsar Convention website: [ramsar.org/wetland/canada](#).
- <sup>61</sup> Environment and Climate Change Canada, Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar), [ec.gc.ca/international/default.asp?lang=En&n=D6691C70-1](#).
- <sup>62</sup> Ramsar Convention Secretariat, The List of Wetlands of International Importance, February 2, 2017, 11. [ramsar.org/sites/default/files/documents/library/sitelist.pdf](#).
- <sup>63</sup> Government of Canada, 5.
- <sup>64</sup> Government of Canada, 5.
- <sup>65</sup> Lynch-Stewart, 1992, 9.
- <sup>66</sup> Government of Canada, 11.
- <sup>67</sup> Government of Canada, 6.
- <sup>68</sup> Pauline Lynch-Stewart, Paula Neice, Clayton Rubec and Ingrid Kessel-Taylor, *The Federal Policy on Wetland Conservation: Implementation Guide for Federal Land Managers*, Canadian Wildlife Service: Ottawa, 1996. [nawcc.wetlandnetwork.ca/Fed%20Policy%20Wetland%20Conserv\\_Implement%20Guide%20for%20Fed%20Land%20Mgrs.pdf](#).
- <sup>69</sup> Lynch-Stewart, 1992, 11.
- <sup>70</sup> Government of Canada, 7.
- <sup>71</sup> Government of Canada, 8.
- <sup>72</sup> Lynch-Stewart, 1992, 11.
- <sup>73</sup> Government of Canada, 10.
- <sup>74</sup> Government of Canada, 2, 3, 4.
- <sup>75</sup> Fisheries and Oceans Canada, 1986, 5.
- <sup>76</sup> Fisheries and Oceans Canada, 1986, 7.
- <sup>77</sup> RSC 1985, c. F-14, as amended by SC 2012, c. 19, s. 6.1.
- <sup>78</sup> RSC 1985, c. F-14, as amended by SC 2012, c. 19, s. 6.
- <sup>79</sup> Fisheries and Oceans Canada, 1986, 21.
- <sup>80</sup> Fisheries Act, 1985, section 6 (6). See Poulton, 2016, 24.
- <sup>81</sup> Fisheries and Oceans Canada, *Fisheries Protection Policy Statement* (2013), 12–15. [dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html](#).
- <sup>82</sup> For two discussions of the changes, see Jason Unger, “Lamenting What We HADD? A Fisheries Act Habitat Dirge or Much Ado About Nothing” (2016) 29, *Journal of Environmental Law and Practice*, 1; Poulton, 2016.
- <sup>83</sup> Poulton, 2016, 30–35.
- <sup>84</sup> Jason T. Quigley and David J. Harper, “Effectiveness of Fish Habitat Compensation in Canada in Achieving No Net Loss,” *Environmental Management*, 37: 3 2006, 351. [ceaa-acee.gc.ca/050/documents/48711/48711F.pdf](#).
- <sup>85</sup> Quigley and Harper, 349.
- <sup>86</sup> SENES Consultants Limited, *Fish Habitat Banking in Canada: Opportunities and Challenges*. Richmond Hill: 2012, 3. [dfo-mpo.gc.ca/Library/347440.pdf](#).
- <sup>87</sup> Commissioner of the Environment and Sustainable Development, *2009 Spring Report of the Commissioner of the Environment and Sustainable Development*, Chapter 1: Protecting Fish Habitat.



- (Ottawa: Office of the Auditor General of Canada, 2009), 12. [oag-bvg.gc.ca/internet/English/parl\\_cesd\\_200905\\_01\\_e\\_32511.html](http://oag-bvg.gc.ca/internet/English/parl_cesd_200905_01_e_32511.html).
- <sup>88</sup> Poulton, 2016, 35.
- <sup>89</sup> Warren Noga and W.L. Adamowicz, *A Study of Canadian Conservation Offset Programs*, Sustainable Prosperity: Ottawa, 2014, 24.
- <sup>90</sup> Fisheries and Oceans Canada, Practitioners Guide to the Risk Management Framework for DFO Habitat Management Staff – Version 1.0, p. 5, [dfo-mpo.gc.ca/Library/343443.pdf](http://dfo-mpo.gc.ca/Library/343443.pdf).
- <sup>91</sup> Fisheries and Oceans Canada, *Fisheries Productivity Investment Policy: A Proponent's Guide to Offsetting*, November 2013. [dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/index-eng.html](http://dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/index-eng.html).
- <sup>92</sup> Fisheries and Oceans Canada, 2013, 11.
- <sup>93</sup> As noted by Clayton Rubec, Ingrid Kessel-Taylor and Pauline Lynch-Stewart in their review of wetlands law and policy tools across Canada, there is a need to use the legal tools that are available, as “their potential for wetland protection is largely ‘unfulfilled’ to date.” *Wetlands and Government: Policy and Legislation for Wetland Conservation in Canada*, North American Wetlands Conservation Council (Canada): Ottawa, 1999, 13, 20.
- <sup>94</sup> Government of Alberta, Wetland Offset Program Description, Water Policy Branch, Alberta Environment and Parks. Edmonton, September 2015, 1. [aep.alberta.ca/water/programs-and-services/wetlands/documents/WetlandOffsetProgramDescription-Sep2015.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/WetlandOffsetProgramDescription-Sep2015.pdf).
- <sup>95</sup> Government of Alberta, Alberta Wetland Policy, Water Policy Branch, Edmonton, September 2013, 2. [aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandPolicy-Sep2013.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandPolicy-Sep2013.pdf).
- <sup>96</sup> Government of Alberta, 2013, 2.
- <sup>97</sup> Government of Alberta, 2013, 16.
- <sup>98</sup> Government of Alberta. Alberta Wetland Mitigation Directive. Water Policy Branch, Alberta Environment and Parks. Edmonton, 2015 (updated February 16, 2017), 4. [aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandMitigationDirective-Feb2017.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandMitigationDirective-Feb2017.pdf).
- <sup>99</sup> Government of Alberta, 2013, 13.
- <sup>100</sup> Government of Alberta, 2013, 11–12.
- <sup>101</sup> Government of Alberta. 2015. Alberta Wetland Mitigation Directive, 8.
- <sup>102</sup> Government of Alberta. 2015. Alberta Wetland Mitigation Directive, 7.
- <sup>103</sup> Government of Alberta, 2013, 19.
- <sup>104</sup> Government of Alberta, Alberta Wetland Policy Implementation Fact Sheet Agriculture, June 15, 2016, 2 [aep.alberta.ca/water/programs-and-services/wetlands/documents/Wetland-FactSheet-Agriculture-Jun15-2016.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/Wetland-FactSheet-Agriculture-Jun15-2016.pdf).
- <sup>105</sup> Government of Alberta, 2013, 18. According to the directive, protocols are under development and not yet available, p. 5.
- <sup>106</sup> Shari Clare, “Avoid, minimize, and compensate: Pitfalls of the common decision sequence to protect wetlands,” Business and Biodiversity Offsets Programme Webinar, August 3, 2016. [bbop.forest-trends.org/pages/webinars](http://bbop.forest-trends.org/pages/webinars).
- <sup>107</sup> Government of Alberta, Wetland Mitigation Directive, 11. Clare points out, however, that in the Nose Creek watershed, where the City of Calgary is located, the actual cost of wetland restoration, including landowner payments, restoration costs and transaction costs, is over \$34,000, about twice the in-lieu fee for that area (Shari Clare, 2016). Because of the higher land values around urban areas, a greater emphasis on regulatory enforcement of avoidance is intended to protect existing wetlands on the urban fringe. (Anish Neupane, Manager, Biodiversity and Ecosystem Services, Alberta Environment and Parks, personal communication, March 21, 2017).
- <sup>108</sup> Government of Alberta, Alberta Wetland Mitigation Directive, 2015, 6.
- <sup>109</sup> Government of Alberta, Wetland Offset Program Description, September 2015, 2.
- <sup>110</sup> Government of Alberta, Wetland Application Checklist, September 2015. [aep.alberta.ca/water/programs-and-services/wetlands/documents/WetlandApplicationChecklist-Sep2015.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/WetlandApplicationChecklist-Sep2015.pdf).
- <sup>111</sup> Government of Alberta, Wetland Application Checklist, September 2015, 2.
- <sup>112</sup> Government of Alberta, Alberta Wetland Mitigation Directive, 2015, 4.
- <sup>113</sup> Craig Bishop, Manager of Environmental Services and Education, Alberta, Ducks Unlimited Canada, personal communication, April 11, 2017.
- <sup>114</sup> Arlene Kwasniak, The New Alberta Wetlands Policy: White Area Wetlands, Just a Pawn in the Game? ABlawg.ca, September 17, 2013. [ablawg.ca/2013/09/17/the-new-alberta-wetland-policy-white-area-wetlands-just-a-pawn-in-the-game](http://ablawg.ca/2013/09/17/the-new-alberta-wetland-policy-white-area-wetlands-just-a-pawn-in-the-game).
- <sup>115</sup> Kerry ten Kate, Josh Bishop and Ricardo Bayon, (2004), *Biodiversity Offsets: Views, Experience, and the Business Case* (Gland, Switzerland: IUCN and Insight Investment, 2004), 70. [cmsdata.iucn.org/](http://cmsdata.iucn.org/)

[downloads/bdoffsets.pdf](#).

- <sup>116</sup> 73 Fed Reg 19657.
- <sup>117</sup> Thorsten Hebben, Director, Surface Water Policy, Alberta Environment and Parks, personal communication, March 16, 2017.
- <sup>118</sup> Government of Alberta, Alberta Wetland Mitigation Directive, 2015, 1.
- <sup>119</sup> Clare, 2016.
- <sup>120</sup> Government of Alberta, Alberta Wetland Policy Implementation Fact Sheet Forestry, July 4, 2016. [aep.alberta.ca/water/programs-and-services/wetlands/documents/Wetland-FactSheet-Forestry-Jul04-2016.pdf](#).
- <sup>121</sup> Public Lands Act, RSA 2000, c P-40, s 3.
- <sup>122</sup> Regarding the important role of ephemeral wetlands (vernal pools) in Ontario, see Don Scallen, “Here today, gone tomorrow,” *ON Nature*, Spring 2017, 24–28.
- <sup>123</sup> Clare et al., 2011.
- <sup>124</sup> Clare, 2016.
- <sup>125</sup> New Brunswick Natural Resources and Energy and New Brunswick Environment and Local Government, *New Brunswick Wetlands Conservation Policy* (July 2002), 10. [www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Report-Rapport/WetlandsTerresHumides.pdf](#).
- <sup>126</sup> New Brunswick, 2002, 3.
- <sup>127</sup> New Brunswick Department of the Environment, Wetland Mitigation Operational Protocols, (Draft) June 19, 2009, 3–4. (Unpublished, copy on file with the author). The term “practical alternatives” is defined in the protocols as “available and feasible options considering cost, existing technology and logistics based on the overall purpose of the project” (2).
- <sup>128</sup> New Brunswick, 2002, 12–13.
- <sup>129</sup> New Brunswick, 2009, 3.
- <sup>130</sup> New Brunswick, 2009, 3.
- <sup>131</sup> New Brunswick, Fact Sheet: Wetland Compensation in New Brunswick (n.d.).
- <sup>132</sup> New Brunswick, 2009, 4–5 (emphasis in original).
- <sup>133</sup> New Brunswick, Fact Sheet, 2. Wetland Conservation Consultants are described here as “individuals who have a combination of education in wetland restoration, delineation, hydrology, wetland soils and botany, and have a minimum of 5 years [of] field and/or demonstrated experience in providing successful wetland compensation projects.”
- <sup>134</sup> New Brunswick, 2009, 8.
- <sup>135</sup> New Brunswick, Fact Sheet, 2.
- <sup>136</sup> Christie Ward, Biologist, Surface Water Protection, New Brunswick Department of Environment and Local Government, personal communication, May 1, 2017.
- <sup>137</sup> New Brunswick, 2009, 8–9.
- <sup>138</sup> Christie Ward, personal communication, September 9 and 16, 2016.
- <sup>139</sup> Ward, 2016.
- <sup>140</sup> Ward, May 1, 2017.
- <sup>141</sup> Ward, 2017
- <sup>142</sup> New Brunswick, 2009, 5.
- <sup>143</sup> New Brunswick, *Fact Sheet*, 1–2. New Brunswick’s Fact Sheet refers only to the former rationale, though the possibility of failure is dealt with separately.
- <sup>144</sup> Ward, September 9, 2016.
- <sup>145</sup> New Brunswick, 2009, 6.
- <sup>146</sup> Ward, September 9, 2016.
- <sup>147</sup> Ward, September 9, 2016.
- <sup>148</sup> Government of Nova Scotia, *Nova Scotia Wetland Conservation Policy* (September 2011), 9. [novascotia.ca/nse/wetland/docs/Nova.Scotia.Wetland.Conservation.Policy.pdf](#).
- <sup>149</sup> Environment Act, SNS 1994-95, c 1.
- <sup>150</sup> Environmental Goals and Sustainable Prosperity Act, SNS 2007, c 42.
- <sup>151</sup> Government of Nova Scotia, 2011, 2–3.
- <sup>152</sup> Krista Hilchey, Wetland Specialist, Nova Scotia Ministry of the Environment, Personal communication, February 15, 2017.
- <sup>153</sup> The wetlands inventory is available on Nova Scotia Canada’s Ecosystems and Habitats Program Overview website at [novascotia.ca/natr/wildlife/habitats/wetlands.asp](#).
- <sup>154</sup> Hilchey.
- <sup>155</sup> Government of Nova Scotia, 2011, 10.
- <sup>156</sup> Government of Nova Scotia, 2011, 10.



- <sup>157</sup> Government of Nova Scotia, 2011, 10.
- <sup>158</sup> Government of Nova Scotia, 2011, 9. The other three objectives are as follows: to promote wetland protection and stewardship and increase awareness of the importance of wetlands in the landscape; to promote a long-term gain in wetland types that have experienced high historic losses, in order to restore beneficial ecosystem services and functions across the province; and to encourage the use of buffers to better ensure the integrity of wetlands adjacent to development (i.e., residential, commercial, industrial) and agricultural, mining and forestry operations. (14–16.)
- <sup>159</sup> Government of Nova Scotia, 2011, 11–12.
- <sup>160</sup> Government of Nova Scotia, 2011, 12. The phrase “necessary public function” is defined within the policy (18): “A service or utility, role or capacity deemed essential to Nova Scotians. Such functions involve projects that provide public service on [a] provincial scale. They include public transportation projects, public infrastructure, linear pipeline or transportation corridors or electrical supply infrastructure, projects necessary for public safety and the protection of adjacent properties and infrastructure and land transactions authorized through an Order of Executive Council.” Note that an order of executive council is required for land transactions only, whereas the other items listed may be treated as necessary by a development approval authority.
- <sup>161</sup> Government of Nova Scotia, 2011, 12.
- <sup>162</sup> Government of Nova Scotia, “Wetland Compensation: What’s Required and What Are My Options,” 1. [novascotia.ca/nse/wetland/docs/Wetland\\_Compensation.pdf](http://novascotia.ca/nse/wetland/docs/Wetland_Compensation.pdf).
- <sup>163</sup> Government of Nova Scotia, “Wetland Compensation: What’s Required and What Are My Options,” 1.
- <sup>164</sup> Government of Nova Scotia, “Wetland Compensation: What’s Required and What Are My Options,” 2.
- <sup>165</sup> Hilchey.
- <sup>166</sup> Government of Nova Scotia, “So You Need to Alter a Wetland ... “ (May 2013). [novascotia.ca/nse/wetland/docs/So.You.Need.to.Alter.a.Wetland.pdf](http://novascotia.ca/nse/wetland/docs/So.You.Need.to.Alter.a.Wetland.pdf).
- <sup>167</sup> Government of Nova Scotia, 2011, 12.
- <sup>168</sup> Except where otherwise noted, this summary is based entirely on the information and analysis provided in Monique Poulin, Stéphanie Pellerin, Jérôme Cimon-Morin, Sophie Lavallée, Geneviève Courchesne and Yuri Tendland, “Inefficacy of wetland legislation for conserving Quebec wetlands as revealed by mapping of recent disturbances,” *Wetlands Ecology and Management* (2016) 24, 651–665.
- <sup>169</sup> Environmental Quality Act, CQLR c Q-2.
- <sup>170</sup> Poulin et al., 653. This authority was formalized by An Act Respecting Compensation Measures for the Carrying Out of Projects Affecting Wetlands or Bodies of Water, SQ 2012 c 14. See also Ministère du Développement durable, de l’Environnement et des Parcs, *Les milieux humides et l’autorisation environnementale*, (Québec: Ministère du Développement durable, de l’Environnement et des Parcs, Direction du patrimoine écologique et des parcs, Direction des politiques de l’eau et Pôle d’expertise hydrique et naturel, 2012). [mdelcc.gouv.qc.ca/eau/rives/milieux-humides-autorisations-env.pdf](http://mdelcc.gouv.qc.ca/eau/rives/milieux-humides-autorisations-env.pdf).
- <sup>171</sup> Ducks Unlimited Canada, “Quebec passes legislation to conserve wetlands and water,” June 19, 2017. [www.ducks.ca/stories/policy/quebec-passes-legislation-conserve-wetlands-water/](http://www.ducks.ca/stories/policy/quebec-passes-legislation-conserve-wetlands-water/)
- <sup>172</sup> Poulin et al., 659.
- <sup>173</sup> Poulin et al., 661, 656.
- <sup>174</sup> Poulin et al., 659.
- <sup>175</sup> Poulin et al., 662.
- <sup>176</sup> This section is based on “Saskatchewan’s Experience with Mitigation Policy and Guidelines,” a PowerPoint presentation by Peter Joyce, a strategic conservation specialist in the Fish, Wildlife and Lands Branch, Saskatchewan Ministry of the Environment (no date), and subsequent personal communication, where indicated, with Mr. Joyce on February 16, 2017.
- <sup>177</sup> Joyce, 2017.
- <sup>178</sup> Joyce, 2017.
- <sup>179</sup> British Columbia Ministry of the Environment, *Environmental Mitigation Policy* (May 13, 2014). [env.gov.bc.ca/emop](http://env.gov.bc.ca/emop).
- <sup>180</sup> British Columbia Ministry of the Environment, *Procedures for Mitigating Impacts on Environmental Values (Environmental Mitigation Procedures)* (May 27, 2014). [env.gov.bc.ca/emop](http://env.gov.bc.ca/emop).
- <sup>181</sup> For a brief review of the some of the key aspects of the offset provisions of the policy and procedures see Poulton, June 2015, 14–16.
- <sup>182</sup> Interview with Lyle Gawalko, Acting Manager, Ecosystem Conservation, British Columbia Ministry of Environment, October 3, 2016.
- <sup>183</sup> Newfoundland and Labrador Department of Environment and Conservation, *Policy for Development in Wetlands*, re-issue date January 17, 2001, section 5.1. [env.gov.nl.ca/env/waterres/regulations/policies/wetlands.html](http://env.gov.nl.ca/env/waterres/regulations/policies/wetlands.html).
- <sup>184</sup> Newfoundland and Labrador Department of Environment and Conservation.
- <sup>185</sup> Newfoundland and Labrador Department of Environment and Conservation, section 5.1.

- <sup>186</sup> Kamal Abdel-Razek, Manager, Water Rights and Investigations Section, Water Resources Management Division, Department of Environment and Climate Change, Newfoundland and Labrador, telephone interview, September 27, 2016.
- <sup>187</sup> Abdel-Razek, 2016.
- <sup>188</sup> MNRF, 2017, 43.
- <sup>189</sup> Regarding the role of government as “provider, curator and source of authoritative biodiversity information,” “broker” and “standard setter,” see Kerry ten Kate and M.L.A. Crowe, *Biodiversity Offsets: Policy options for governments*. An input paper for the IUCN Technical Study Group on Biodiversity Offsets (Gland, Switzerland: IUCN, 2014), 50, 52–53. Regarding the need for sufficient funds and expertise for administration, see IUCN, 2016, 8.
- <sup>190</sup> Shari Clare and Irene F. Creed, “Tracking wetland loss to improve evidence-based wetland policy learning and decision making,” *Wetlands Ecology and Management* (2014, 22), 242.
- <sup>191</sup> MNRF, 2017, 41.
- <sup>192</sup> IUCN, 2016, 7.
- <sup>193</sup> Clare et al., 2011, 170.
- <sup>194</sup> Gardner, 2003, 614.
- <sup>195</sup> IUCN, 2016, 8.
- <sup>196</sup> Ontario Nature, 2016, 11.
- <sup>197</sup> Clare et al., 2011, 170.
- <sup>198</sup> Poulton, June 2015, 40.
- <sup>199</sup> Salzman and Ruhl, 2000; Clare et al., 2011, 167, 169–170; see also Hough and Robertson, 2009, regarding permit denials.
- <sup>200</sup> IUCN, 2016, 7–8. See also Clare and Creed, 2014, 235.
- <sup>201</sup> Salzman and Ruhl, 2000.
- <sup>202</sup> MNRF, 2017, 20.
- <sup>203</sup> MNRF, 2017, 25.
- <sup>204</sup> 40 CFR § 332.8(f)(1)(ii); 40 CFR § 230.98(f)(1)(ii) (2008).
- <sup>205</sup> Ontario Ministry of Municipal Affairs and Housing, *Municipal-Aboriginal Relationships: Case Studies* (last modified October 25, 2015). [mah.gov.on.ca/Page6054.aspx](http://mah.gov.on.ca/Page6054.aspx), 1.
- <sup>206</sup> See the case studies involving the Mohawk Council of Akwesasne, the Algonquin First Nations and the Six Nations of the Grand River Territory in Larry McDermott and Anne Bell, 14–15, 17–18, 19–21 and 25–26.
- <sup>207</sup> Clara MacCallum and Leela Viswanathan, “The Crown Duty to Consult and Ontario Municipal–First Nations Relations: Lessons Learned from the Red Hill Valley Parkway Project,” *Canadian Journal of Urban Research*, 22:1, Supplement 2013, 5. [queensu.ca/pwip/sites/webpublish.queensu.ca/pwipwww/files/files/publications/crown-duty-to-consult.pdf](http://queensu.ca/pwip/sites/webpublish.queensu.ca/pwipwww/files/files/publications/crown-duty-to-consult.pdf).
- <sup>208</sup> MacCallum and Viswanathan, 3.
- <sup>209</sup> Sheri Longboat, “Beyond Consultation: Lessons from Joint Stewardship,” *Plan Canada* (Winter 2016), 33.
- <sup>210</sup> Ontario Ministry of Municipal Affairs and Housing, *Provincial Policy Statement 2014*, section 4.3. Further, section 4.6 states, “This Provincial Policy Statement shall be implemented in a manner that is consistent with the Ontario *Human Rights Code* and the *Canadian Charter of Rights and Freedoms*.” [mah.gov.on.ca/AssetFactory.aspx?did=10463](http://mah.gov.on.ca/AssetFactory.aspx?did=10463).
- <sup>211</sup> See Prime Minister Trudeau’s renewed commitment to advance reconciliation: [pm.gc.ca/eng/news/2016/12/15/statement-prime-minister-canada-advancing-reconciliation-indigenous-peoples](http://pm.gc.ca/eng/news/2016/12/15/statement-prime-minister-canada-advancing-reconciliation-indigenous-peoples). Ontario’s commitment is part of a plan announced on May 30, 2016, to “invest more than \$250 million over the next three years on programs and actions focused on reconciliation”: [news.ontario.ca/mirr/en/2016/05/the-journey-together-ontarios-commitment-to-reconciliation-with-indigenous-peoples.html](http://news.ontario.ca/mirr/en/2016/05/the-journey-together-ontarios-commitment-to-reconciliation-with-indigenous-peoples.html).
- <sup>212</sup> Frank Iacobucci, “The path to reconciliation with indigenous peoples starts with consent,” *Globe and Mail* (July 13, 2016). [theglobeandmail.com/opinion/the-path-to-reconciliation-with-indigenous-peoples-starts-with-consent/article30888197](http://theglobeandmail.com/opinion/the-path-to-reconciliation-with-indigenous-peoples-starts-with-consent/article30888197). Iacobucci is senior counsel at Torys LLP and was chief negotiator of the Indian Residential Schools Settlement Agreement.
- <sup>213</sup> “All Peoples have the right to self-determination. It is a fundamental principle in international law, embodied in the Charter of the United Nations and the International Covenant on Civil and Political Rights and the International Covenant on Economic, Social and Cultural Rights. The standard, Free, Prior and Informed Consent (FPIC), as well as Indigenous Peoples’ rights to lands, territories and natural resources are embedded within the universal right to self-determination. The normative framework for FPIC consists of a series of international legal instruments including the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP), the International Labour Organization Convention 169 (ILO 169), and the Convention on Biological Diversity (CBD), among many others, as well as national laws ...”, Food and Agriculture Organization of the United Nations, *Free Prior and Informed Consent: An Indigenous peoples’ right and a good practice for local communities* (2016), 12–13. [fao.org/3/a-i6190e.pdf](http://fao.org/3/a-i6190e.pdf).
- <sup>214</sup> McDermott and Bell, 3.

- <sup>215</sup> See article 8(j) of the Convention on Biological Diversity. [cbd.int/traditional/](http://cbd.int/traditional/).
- <sup>216</sup> MNRF, 2017, 31.
- <sup>217</sup> See McDermott and Bell regarding the integration of Indigenous Traditional Knowledge, 10–12, 15, 27.
- <sup>218</sup> MNRF, 2017, 35.
- <sup>219</sup> MNRF, 2017, 42.
- <sup>220</sup> MNRF, 2017, 8.
- <sup>221</sup> Ontario Ministry of Municipal Affairs and Housing, 2014 (sections 2.1.4 and 2.1.5). See Figure 1 on page 15 of the policy for the exact delineation. In both cases, development on lands adjacent to these features is likewise prohibited unless “it has been demonstrated that there will be no negative impacts on the natural features or on their ecological functions” (section 2.1.8).
- <sup>222</sup> See Ontario Ministry of Municipal Affairs and Housing 2014, PPS section 2.1.9 and definition of development, which excludes infrastructure development and works subject to the Drainage Act. The PPS does not cover forestry.
- <sup>223</sup> Clare and Creed, 243.
- <sup>224</sup> Poulin et al., 659.
- <sup>225</sup> Government of Canada, 4
- <sup>226</sup> Website of the federal, provincial and territorial working group on biodiversity established following Canada’s ratification of the Convention on Biological Diversity and tasked to develop the Canadian Biodiversity Strategy: [biodivcanada.ca/default.asp?lang=En&n=F07D520A-1&offset=1&toc=show](http://biodivcanada.ca/default.asp?lang=En&n=F07D520A-1&offset=1&toc=show).
- <sup>227</sup> MNRF, 2017, 35.
- <sup>228</sup> MNRF, 2017, 42.
- <sup>229</sup> Ontario’s Draft Policy Statement on Wetlands (1991) introduced “the concept of no loss of provincially significant wetlands, particularly for that area of the province in which wetland loss has been high.” Lynch-Stewart, 33.
- <sup>230</sup> Submission to MNRF regarding EBR Registry Number 012-7675, November 16, 2016, endorsed by 34 organizations, including Ontario Nature, the Ontario Biodiversity Council, Environmental Defence, the Canadian Environmental Law Association, and the David Suzuki Foundation.
- <sup>231</sup> Lynch-Stewart, 7. At a wetlands policy and biodiversity offsetting workshop hosted by Ontario Nature and Ducks Unlimited Canada in October 2015, 73 percent of participants expressed the view that Great Lakes coastal wetlands should be strictly off-limits to development; 64 percent expressed the same opinion about provincially significant wetlands.
- <sup>232</sup> Business and Biodiversity Offsets Programme (BBOP). 2012. *Resource Paper: Limits to What Can Be Offset*. BBOP, Washington, DC, 2. [forest-trends.org/documents/files/doc\\_3128.pdf](http://forest-trends.org/documents/files/doc_3128.pdf).
- <sup>233</sup> IUCN, 2016, 2.
- <sup>234</sup> Ontario Nature, 2014, 16.
- <sup>235</sup> Ontario Nature, 2016, 13–14.
- <sup>236</sup> Newfoundland and Labrador Department of Environment and Conservation, 2001, section 5.1.
- <sup>237</sup> New Brunswick, 2009, 3–4.
- <sup>238</sup> Ontario Ministry of Natural Resources and Forestry. *Wetland Conservation in Ontario: A Discussion Paper*. 2015. See red areas, where over 85 percent of wetlands have been lost, on left-hand map, p. 8. [ontla.on.ca/library/repository/mon/29007/331299.pdf](http://ontla.on.ca/library/repository/mon/29007/331299.pdf).
- <sup>239</sup> Government of Canada, 7.
- <sup>240</sup> Gardner, 2003, 577.
- <sup>241</sup> National Research Council, 4.
- <sup>242</sup> IUCN, 2016, 5.
- <sup>243</sup> See Poulton, June 2015, regarding offsetting systems generally (p. 35). See also Gardner, 2003, who writes that “clearly stated restoration goals and objectives” are characteristic of the more successful wetland restoration incentive programs (p. 577).
- <sup>244</sup> This is true of offset programs generally. See David W. Poulton, *Biodiversity Offsets: A Primer for Canada*. Ottawa: Sustainable Prosperity and the Institute of the Environment at the University of Ottawa, February 2014, 4.
- <sup>245</sup> MNRF, 2017, 42-43.
- <sup>246</sup> Government of Nova Scotia, 2011, 9.
- <sup>247</sup> Lynch-Stewart raised the issue in 1992, when Canadian wetland policy was being developed: “In the flurry of discussion surrounding the NNL [no net loss] goal, it is sometimes forgotten that in some areas of the U.S. and Canada, the wetland resource is so seriously depleted that we need to work towards net gain of wetlands.” 9.
- <sup>248</sup> Dan Kraus, “Why no net loss in biodiversity offsets fails nature and people.” November 25, 2015. [natureconservancy.ca/en/blog/why-no-net-loss-in.html](http://natureconservancy.ca/en/blog/why-no-net-loss-in.html).
- <sup>249</sup> Business and Biodiversity Offsets Programme (BBOP). *Standard on Biodiversity Offsets*. BBOP: Washington, DC, 2012. [forest-trends.org/documents/files/doc\\_3078.pdf](http://forest-trends.org/documents/files/doc_3078.pdf).

- <sup>250</sup> Ontario Nature, 2014, 12–14.
- <sup>251</sup> Ontario Nature, 2016, 14.
- <sup>252</sup> See David W. Poulton, “Biodiversity and Conservation Offsets: A Guide for Albertans,” CIRL Occasional Paper No.48, Canadian Institute of Resources Law, Calgary, May 2015, 23; and Poulton, June 2015, 8.
- <sup>253</sup> Given the difficulty of measuring wetland function, area is used as proxy. Ward, September 9, 2016.
- <sup>254</sup> Government of Nova Scotia, “Wetland Compensation: What’s Required and What Are My Options?” 1.
- <sup>255</sup> In general, research, education, interpretive signage, etc. are “not considered legitimate sources of offset credits for they do not produce any measurable improvement in either ecosystem function or security.” Poulton, May 2015, 20–21.
- <sup>256</sup> McDermott and Bell, 7. The experiences of Alderville First Nation and the Mohawk Council of Akwesasne similarly illustrate the difficulty of negotiating higher standards than the minimum set by the government. (30)
- <sup>257</sup> Lynch-Stewart, 7.
- <sup>258</sup> MNRF, 2017, 43.
- <sup>259</sup> Poulton, June 2015, 37.
- <sup>260</sup> Poulton, May 2015, 17, 20–21.
- <sup>261</sup> In their review of Canadian conservation offset programs, Noga and Adamowicz found that there is “little assessment of impact on other ecological functions and services.” (42).
- <sup>262</sup> Business and Biodiversity Offset Programme (BBOP 2012b), *Resource Paper: No Net Loss and Loss-Gain Calculations in Biodiversity Offsets* (Washington DC: Forest Trends), [forest-trends.org/documents/files/doc\\_3103.pdf](http://forest-trends.org/documents/files/doc_3103.pdf); Fabien Quétier and Sandra Lavorel, “Assessing Ecological Equivalence in Biodiversity Offset Schemes: Key Issues and Solutions” (2012) 144:12, *Biological Conservation* 2991; Bull et al., 2013, 1.
- <sup>263</sup> Poulton, June 2015.
- <sup>264</sup> BBOP, 2013, 6.
- <sup>265</sup> Ontario Nature, 2014, 32.
- <sup>266</sup> McDermott and Bell, 4.
- <sup>267</sup> Martine Maron, Christopher D. Ives, Heini Kujala, Joseph W. Bull, Fleur J.F. Maseyk, Sarah Bekessy, Ascelin Gordon, James E.M. Watson, Pia E. Lentini, Philip Gibbons, Hugh P. Possingham, Richard J. Hobbs, David A. Keith, Brendan A. Wintle and Megan C. Evans, “Taming a Wicked Problem: Resolving Controversies in Biodiversity Offsetting,” *BioScience Advance Access* published April 13, 2016, 5. [macroecointern.dk/pdf-reprints/Maron\\_BioScience.pdf](http://macroecointern.dk/pdf-reprints/Maron_BioScience.pdf).
- <sup>268</sup> MNRF, 2017, 42.
- <sup>269</sup> See Ramsar Convention on Wetlands, Scientific and Technical Review Panel, *Avoiding, Mitigating, and Compensating for Loss and Degradation of Wetlands in National Laws and Policies*, Briefing Note Number 3, April 2012, [ramsar.org/sites/default/files/documents/library/bn3.pdf](http://ramsar.org/sites/default/files/documents/library/bn3.pdf); IUCN, 2016, 2; and BBOP 2012b, 17.
- <sup>270</sup> Government of Alberta, *Alberta Wetland Mitigation Directive*, 2015, 4.
- <sup>271</sup> McDermott and Bell, 4. Note, for this report the authors have added the word “systems” after Indigenous Traditional Knowledge, updating the original at the request of Indigenous colleagues.
- <sup>272</sup> Clare et al., 2011, 165.
- <sup>273</sup> Poulton, May 2015, 5.
- <sup>274</sup> Hough and Robertson, 23.
- <sup>275</sup> See Clare et al., 2011, 169.
- <sup>276</sup> Clare et al., 2011, 168, 170.
- <sup>277</sup> Ramsar Convention on Wetlands, 2012.
- <sup>278</sup> IUCN, 2016, 3.
- <sup>279</sup> MNRF, 2017, 43.
- <sup>280</sup> National Research Council. 4.
- <sup>281</sup> National Research Council, 4.
- <sup>282</sup> B.A. McKenney and J.M. Kiesecker, Table 1, 169, 173.
- <sup>283</sup> Government of Alberta, *Alberta Wetland Mitigation Directive*, 7.
- <sup>284</sup> See Business and Biodiversity Offsets Programme (2013, 6), principle 7: “Equity: A biodiversity offset should be designed and implemented in an equitable manner, which means the sharing among stakeholders of the rights and responsibilities, risks and rewards associated with a project and offset in a fair and balanced way, respecting legal and customary arrangements. Special consideration should be given to respecting both internationally and nationally recognized rights of indigenous peoples and local communities.”
- <sup>285</sup> McDermott and Bell, 5.
- <sup>286</sup> MNRF, 2017, 35.
- <sup>287</sup> MNRF, 2017, 43.

- <sup>288</sup> BBOP, 2013, p. 6. See also IUCN, 2016, p. 7, and Dave Poulton, Alberta's New Wetland Policy as a Conservation Offset System. ABlawg.ca September 25, 2013, [ablawg.ca/2013/09/25/albertas-new-wetland-policy-as-a-conservation-offset-system](http://ablawg.ca/2013/09/25/albertas-new-wetland-policy-as-a-conservation-offset-system).
- <sup>289</sup> Ontario Nature, 2014, 21–22.
- <sup>290</sup> McDermott and Bell, 5.
- <sup>291</sup> Government of Nova Scotia, 2011, 13.
- <sup>292</sup> Ontario Nature, 2014, 19–20.
- <sup>293</sup> Noga and Adamowicz, 35.
- <sup>294</sup> Bobolink Round Table, Progress Report No. 1. Toronto: June 2012, 7.
- <sup>295</sup> Poulton, May 2015, 21.
- <sup>296</sup> IUCN, 2016, 7.
- <sup>297</sup> Poulton, June 2015, 29.
- <sup>298</sup> Poulton, May 2015, 18.
- <sup>299</sup> Maron et al., 2016.
- <sup>300</sup> Gardner, 2003, 611.
- <sup>301</sup> Gardner, 2003, 615–618.
- <sup>302</sup> Ontario Nature, 2016, 44–45.
- <sup>303</sup> Gardner, 2003, 619.
- <sup>304</sup> Hough and Robertson, 2009, 25.
- <sup>305</sup> This is a long-standing concern. See Lynch-Stewart, 1992, 8.

# References

---

## Statutory and Regulatory References

### Alberta

Public Lands Act, RSA 2000, c P-40.

### Canada (Federal)

Fisheries Act, 1985, RSC 1985, c F-14, as amended.

### Nova Scotia

Environment Act, SNS 1994-95, c 1.

Environmental Goals and Sustainable Prosperity Act, SNS 2007, c 42.

### Quebec

An Act Respecting Compensation Measures for the Carrying Out of Projects Affecting Wetlands or Bodies of Water, SQ 2012 c 14.

An Act Respecting the Conservation of Wetlands and Bodies of Water, SQ 2017 c 14

Environmental Quality Act, CQLR c Q-2.

### United States

Clean Water Act, 33 USC 1251.

Compensatory Mitigation for Losses of Aquatic Resources, 40 CFR § 332.

Compensatory Mitigation for Losses of Aquatic Resources – Final Rule, 73 Fed Reg 19594 (2008).

Navigation and Navigable Waters, Corps of Engineers, Department of the Army, Department of Defense, Processing of Department of the Army Permits, 33 CFR § 325.

Water Resources Development Act, 33 USC § 2317.

Section 404(b)(1) Guidelines for Specification of Disposal Sites for Dredged or Fill Material, 40 CFR § 230.

## Interviews

Abdel-Razek, Kamal. Manager, Water Rights and Investigations Section, Water Resources Management Division, Department of Environment and Climate Change, Newfoundland and Labrador. Personal communication. September 27, 2016.

Bishop, Craig. Manager of Environmental Services and Education, Alberta, Ducks Unlimited Canada. Personal communication. April 11, 2017.

Gawalko, Lyle. Acting Manager, Ecosystem Conservation, British Columbia Ministry of Environment. Personal communication. October 3, 2016.

Hebben, Thorsten. Director, Surface Water Policy, Alberta Environment and Parks, Personal communication. March 16, 2017.

Hilchey, Krista. Wetland Specialist, Nova Scotia Ministry of the Environment. Personal communication. February 15, 2017.

Joyce, Peter. Strategic Conservation Specialist, Fish, Wildlife and Lands Branch, Saskatchewan Ministry of Environment. Personal communication. February 16, 2017.

Neupane, Anish. Manager, Biodiversity and Ecosystem Services, Alberta Environment and Parks. Personal communication. March 21, 2017.



## Policy Guidance and Secondary Sources

- Bell, Anne. "Drawing a line to protect the few remaining wetlands in Niagara." February 2, 2016. [ontario.nature.org/connect/blog/?s=Niagara](http://ontario.nature.org/connect/blog/?s=Niagara).
- Bobolink Round Table, Progress Report No. 1. Toronto: June 2012.
- British Columbia Ministry of the Environment. *Procedures for Mitigating Impacts on Environmental Values* (Environmental Mitigation Procedures). May 27, 2014. [env.gov.bc.ca/emop](http://env.gov.bc.ca/emop).
- British Columbia Ministry of the Environment. *Environmental Mitigation Policy*. May 13, 2014. [env.gov.bc.ca/emop](http://env.gov.bc.ca/emop).
- Bull, Joseph W., K. Blake Suttle, Ascelin Gordon, Navinder J. Singh and E.J. Milner-Gulland. "Biodiversity Offsets in Theory and Practice." *Fauna and Flora International, Oryx*. (2013). [forest-trends.org/documents/files/doc\\_3908.pdf](http://forest-trends.org/documents/files/doc_3908.pdf).
- Business and Biodiversity Offset Programme (BBOP, 2013). *To No Net Loss and Beyond: an Overview of the Business and Biodiversity Offsets Programme*. Washington, DC: Forest Trends, 2013. [forest-trends.org/documents/files/doc\\_3319.pdf](http://forest-trends.org/documents/files/doc_3319.pdf).
- Business and Biodiversity Offsets Programme (BBOP 2012a). *Resource Paper: Limits to What Can Be Offset*. Washington, DC: Forest Trends, 2012. [forest-trends.org/documents/files/doc\\_3128.pdf](http://forest-trends.org/documents/files/doc_3128.pdf).
- Business and Biodiversity Offset Programme (BBOP 2012b). *Resource Paper: No Net Loss and Loss-Gain Calculations in Biodiversity Offsets*. Washington, DC: Forest Trends, 2012. [forest-trends.org/documents/files/doc\\_3103.pdf](http://forest-trends.org/documents/files/doc_3103.pdf).
- Business and Biodiversity Offsets Programme (BBOP 2012c). *Standard on Biodiversity Offsets*. Washington, DC: Forest Trends, 2012. [forest-trends.org/documents/files/doc\\_3078.pdf](http://forest-trends.org/documents/files/doc_3078.pdf).
- Clare, Shari. "Avoid, minimize, and compensate: Pitfalls of the common decision sequence to protect wetlands." Business and Biodiversity Offsets Programme webinar. August 3, 2016. [bbop.forest-trends.org/pages/webinars](http://bbop.forest-trends.org/pages/webinars).
- Clare, Shari, and Irene F. Creed. "Tracking wetland loss to improve evidence-based wetland policy learning and decision making." *Wetlands Ecology and Management* (2014) 22: 235–245.
- Clare, Shari, Naomi Krogman, Lee Foote and Nathan Lemphers. "Where is the avoidance in the implementation of wetland law and policy?" *Wetlands Ecology and Management* 19 (2011): 165–182. [cbd.int/financial/doc/ifrik-innovative-financial-mechanisms-02-2011-en.pdf](http://cbd.int/financial/doc/ifrik-innovative-financial-mechanisms-02-2011-en.pdf).
- Commissioner of the Environment and Sustainable Development. *2009 Spring Report of the Commissioner of the Environment and Sustainable Development*, Chapter 1: Protecting Fish Habitat. Ottawa: Office of the Auditor General of Canada, 2009. [oag-bvg.gc.ca/internet/English/parl\\_cesd\\_200905\\_01\\_e\\_32511.html](http://oag-bvg.gc.ca/internet/English/parl_cesd_200905_01_e_32511.html).
- Cross-Sector Biodiversity Initiative and The Biodiversity Consultancy. "A Cross-Sector Guide for Implementing the Mitigation Hierarchy." Cambridge, UK: Cross-Sector Biodiversity Initiative, 2015. [csbi.org.uk/wp-content/uploads/2015/09/CSBI-Mitigation-Hierarchy-Guide-Sept-2015-1.pdf](http://csbi.org.uk/wp-content/uploads/2015/09/CSBI-Mitigation-Hierarchy-Guide-Sept-2015-1.pdf).
- Darbi, Marianne, Alfred Herberg, Holger Ohlenburg and Wolfgang Wende. *Impact Mitigation and Biodiversity Offsets – Compensation Approaches from Around the World*. Bonn: Federal Agency for Nature Conservation, 2010.
- Ducks Unlimited Canada. "Quebec passes legislation to conserve wetlands and water." June 19, 2017. [www.ducks.ca/stories/policy/quebec-passes-legislation-conserve-wetlands-water/](http://www.ducks.ca/stories/policy/quebec-passes-legislation-conserve-wetlands-water/)
- Ducks Unlimited Canada. "Coastal Wetland Status and Trends: Project Summary," 2015.
- Economics for the Environment Consultancy and the Institute for European Environmental Policy. *The Use of*

*Market-Based Instruments for Biodiversity Protection – The Case of Habitat Banking: Summary Report for the European DG Environment*. London: 2010. [ec.europa.eu/environment/enveco/index.htm](http://ec.europa.eu/environment/enveco/index.htm).

Environment and Climate Change Canada. Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar). [ec.gc.ca/international/default.asp?lang=En&n=D6691C70-1](http://ec.gc.ca/international/default.asp?lang=En&n=D6691C70-1).

Environment Canada. *Operational Framework on the Use of Conservation Allowances*. Ottawa: Environment Canada, 2012. [ec.gc.ca/ee-ea/default.asp?lang=En&n=DAB7DD13-1](http://ec.gc.ca/ee-ea/default.asp?lang=En&n=DAB7DD13-1).

Environmental Protection Agency (EPA), “Mitigation Banking Factsheet.” <https://www.epa.gov/cwa-404/mitigation-banking-factsheet>.

Environmental Protection Agency (EPA). *Wetlands Compensatory Mitigation*. [epa.gov/sites/production/files/2015-08/documents/compensatory\\_mitigation\\_factsheet.pdf](http://epa.gov/sites/production/files/2015-08/documents/compensatory_mitigation_factsheet.pdf).

Environmental Protection Agency (EPA), the Army Corps of Engineers and the Departments of Agriculture, Commerce, Interior, and Transportation. *National Wetlands Mitigation Action Plan* factsheet, 2. [epa.gov/sites/production/files/2015-08/documents/national\\_wetlands\\_mitigation\\_action\\_plan\\_factsheet\\_0.pdf](http://epa.gov/sites/production/files/2015-08/documents/national_wetlands_mitigation_action_plan_factsheet_0.pdf).

Federal, provincial and territorial working group on biodiversity. Website. [biodivcanada.ca/default.asp?lang=En&n=6D6EAF77-1](http://biodivcanada.ca/default.asp?lang=En&n=6D6EAF77-1).

Fisheries and Oceans Canada. *Practitioners Guide to the Risk Management Framework for DFO Habitat Management Staff – Version 1.0*. [dfo-mpo.gc.ca/Library/343443.pdf](http://dfo-mpo.gc.ca/Library/343443.pdf).

Fisheries and Oceans Canada. *Fisheries Productivity Investment Policy: A Proponent’s Guide to Offsetting*. November 2013. [dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/index-eng.html](http://dfo-mpo.gc.ca/pnw-ppe/offsetting-guide-compensation/index-eng.html).

Fisheries and Oceans Canada. *Fisheries Protection Policy Statement*. 2013. [dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html](http://dfo-mpo.gc.ca/pnw-ppe/pol/index-eng.html).

Fisheries and Oceans Canada. *The Department of Fisheries and Oceans Policy for the Management of Fish Habitat*. Ottawa: 1986. [dfo-mpo.gc.ca/Library/23654.pdf](http://dfo-mpo.gc.ca/Library/23654.pdf).

Food and Agriculture Organization of the United Nations. *Free Prior and Informed Consent: An Indigenous peoples’ right and a good practice for local communities 2016*. [fao.org/3/a-i6190e.pdf](http://fao.org/3/a-i6190e.pdf).

Gardner, Royal C. *Lawyers, Swamps and Money: U.S. Wetland Law, Policy and Politics*. Washington, DC: Island Press, 2011.

Gardner, R.C. “Rehabilitating Nature: A Comparative Review of Legal Mechanisms That Encourage Wetland Restoration Efforts.” *Catholic University Law Review* 52:3, Spring 2003: 573–620.

Gibbons, Jack. “Municipal politics all wet when it comes to wetlands.” October 6, 2016. [ontarionature.org/connect/blog/municipal-politics-all-wet-when-it-comes-to-wetlands/#more-4819](http://ontarionature.org/connect/blog/municipal-politics-all-wet-when-it-comes-to-wetlands/#more-4819).

Government of Alberta. Alberta Wetland Policy Implementation Fact Sheet Forestry. July 4, 2016. [aep.alberta.ca/water/programs-and-services/wetlands/documents/Wetland-FactSheet-Forestry-Jul04-2016.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/Wetland-FactSheet-Forestry-Jul04-2016.pdf).

Government of Alberta, Alberta Wetland Policy Implementation Fact Sheet Agriculture. Edmonton: June 15, 2016. [aep.alberta.ca/water/programs-and-services/wetlands/documents/Wetland-FactSheet-Agriculture-Jun15-2016.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/Wetland-FactSheet-Agriculture-Jun15-2016.pdf).

Government of Alberta. Alberta Wetland Mitigation Directive. Edmonton: Water Policy Branch, Alberta Environment and Parks, 2015. [aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandMitigationDirective-Feb2017.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandMitigationDirective-Feb2017.pdf).

Government of Alberta. Wetland Application Checklist. September 2015. [aep.alberta.ca/water/programs-and-services/wetlands/documents/WetlandApplicationChecklist-Sep2015.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/WetlandApplicationChecklist-Sep2015.pdf).

Government of Alberta. Wetland Offset Program Description. Edmonton: Water Policy Branch, Alberta Environment and Parks. September 2015. [aep.alberta.ca/water/programs-and-services/wetlands/documents/WetlandOffsetProgramDescription-Sep2015.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/WetlandOffsetProgramDescription-Sep2015.pdf).

Government of Alberta. *Alberta Wetland Policy*. Edmonton: Water Policy Branch, September 2013. [aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandPolicy-Sep2013.pdf](http://aep.alberta.ca/water/programs-and-services/wetlands/documents/AlbertaWetlandPolicy-Sep2013.pdf).

Government of Canada. *The Federal Policy on Wetland Conservation*. Ottawa: 1991. [nawcc.wetlandnet](http://nawcc.wetlandnet)



- [work.ca/Federal%20Policy%20on%20Wetland%20Conservation.pdf](http://work.ca/Federal%20Policy%20on%20Wetland%20Conservation.pdf).
- Government of Nova Scotia. "So You Need to Alter a Wetland ..." May 2013. [novascotia.ca/nse/wetland/docs/So.You.Need.to.Alter.a.Wetland.pdf](http://novascotia.ca/nse/wetland/docs/So.You.Need.to.Alter.a.Wetland.pdf).
- Government of Nova Scotia. *Nova Scotia Wetland Conservation Policy*. September 2011. [novascotia.ca/nse/wetland/docs/Nova.Scotia.Wetland.Conservation.Policy.pdf](http://novascotia.ca/nse/wetland/docs/Nova.Scotia.Wetland.Conservation.Policy.pdf).
- Government of Nova Scotia. "Wetland Compensation: What's Required and What Are My Options." [novascotia.ca/nse/wetland/docs/Wetland\\_Compensation.pdf](http://novascotia.ca/nse/wetland/docs/Wetland_Compensation.pdf).
- Harper, D.J., and J.T. Quigley. "No Net Loss of Fish Habitat: A Review and Analysis of Habitat Compensation in Canada." *Environmental Management* 36:3 (2005).
- Hough, Palmer, and Morgan Robertson. "Mitigation under Section 404 of the Clean Water Act: where it comes from, what it means." *Wetlands Ecology and Management*, 17:1 (February 2009):15–33. [academia.edu/2130728/Mitigation\\_under\\_Section\\_404\\_of\\_the\\_Clean\\_Water\\_Act\\_where\\_it\\_comes\\_from\\_what\\_it\\_means](http://academia.edu/2130728/Mitigation_under_Section_404_of_the_Clean_Water_Act_where_it_comes_from_what_it_means).
- Iacobucci, Frank. "The path to reconciliation with indigenous peoples starts with consent." *Globe and Mail*, July 13, 2016. [theglobeandmail.com/opinion/the-path-to-reconciliation-with-indigenous-peoples-starts-with-consent/article30888197](http://theglobeandmail.com/opinion/the-path-to-reconciliation-with-indigenous-peoples-starts-with-consent/article30888197).
- International Union for the Conservation of Nature (IUCN). *IUCN Policy on Biodiversity Offsets*. January 29, 2016. [cmsdata.iucn.org/downloads/iucn\\_biodiversity\\_offsets\\_policy\\_jan\\_29\\_2016.pdf](http://cmsdata.iucn.org/downloads/iucn_biodiversity_offsets_policy_jan_29_2016.pdf).
- International Union for the Conservation of Nature (IUCN). *Biodiversity Offsets Technical Study Paper*. Gland, Switzerland: IUCN, 2014. [cmsdata.iucn.org/downloads/final\\_biodiversity\\_offsets\\_paper\\_9nov2014\\_1.pdf](http://cmsdata.iucn.org/downloads/final_biodiversity_offsets_paper_9nov2014_1.pdf).
- Jeandel, Celine, and Delphine Morandeau. "Compensating for damage to biodiversity: the American experience of wetlands banks." *Le Point Sur*, No. 134 (August 2012). [developpement-durable.gouv.fr/IMG/pdf/LPS134EN-2.pdf](http://developpement-durable.gouv.fr/IMG/pdf/LPS134EN-2.pdf).
- Johnson, Jody, and Scott Stoll. "The Municipal Duty to Consult First Nations." Association of Municipal Managers, Clerks and Treasurers of Ontario, Annual Conference and Professional Development Institute, June, 2015. [amcto.com/imis15/Documents/Conference/2015%20Conference/3%20Working%20with%20Aboriginal%20Communities-%20Jody%20Johnson.pdf](http://amcto.com/imis15/Documents/Conference/2015%20Conference/3%20Working%20with%20Aboriginal%20Communities-%20Jody%20Johnson.pdf).
- Joyce, Peter. "Saskatchewan's Experience with Mitigation Policy and Guidelines." Powerpoint presentation. Fish Wildlife and Lands Branch, Saskatchewan Ministry of the Environment (no date).
- Kraus, Dan. "Why no net loss in biodiversity offsets fails nature and people." November 25, 2015. [natureconservancy.ca/en/blog/why-no-net-loss-in.html](http://natureconservancy.ca/en/blog/why-no-net-loss-in.html).
- Kwasniak, Arlene. *The New Alberta Wetlands Policy: White Area Wetlands, Just a Pawn in the Game?* ABlawg.ca September 17, 2013. [ablawg.ca/2013/09/17/the-new-alberta-wetland-policy-white-area-wetlands-just-a-pawn-in-the-game](http://ablawg.ca/2013/09/17/the-new-alberta-wetland-policy-white-area-wetlands-just-a-pawn-in-the-game).
- Longboat, Sheri. "Beyond Consultation: Lessons from Joint Stewardship." *Plan Canada* (Winter 2016).
- Lynch-Stewart, Pauline. *No Net Loss: Implementing "No Net Loss" Goals to Conserve Wetlands in Canada. Issues Paper*, No. 1992-2. Ottawa: North American Wetlands Conservation Council (Canada), 1992. [nawcc.wetlandnetwork.ca/No%20Net%20Loss%201992-2.pdf](http://nawcc.wetlandnetwork.ca/No%20Net%20Loss%201992-2.pdf).
- Lynch-Stewart, Pauline, Paula Neice, Clayton Rubec and Ingrid Kessel-Taylor. *The Federal Policy on Wetland Conservation: Implementation Guide for Federal Land Managers*. Ottawa: Canadian Wildlife Service, 1996. [nawcc.wetlandnetwork.ca/Fed%20Policy%20Wetland%20Conserv\\_Implement%20Guide%20for%20Fed%20Land%20Mgrs.pdf](http://nawcc.wetlandnetwork.ca/Fed%20Policy%20Wetland%20Conserv_Implement%20Guide%20for%20Fed%20Land%20Mgrs.pdf).
- MacCallum, Clara, and Leela Viswanathan. "The Crown Duty to Consult and Ontario Municipal–First Nations Relations: Lessons Learned from the Red Hill Valley Parkway Project." *Canadian Journal of Urban Research* 22:1 (Supplement 2013). [queensu.ca/pwip/sites/webpublish.queensu.ca/pwipwww/files/files/publications/crown-duty-to-consult.pdf](http://queensu.ca/pwip/sites/webpublish.queensu.ca/pwipwww/files/files/publications/crown-duty-to-consult.pdf).

- Maron, Martine, Christopher D. Ives, Heini Kujala, Joseph W. Bull, Fleur J.F. Maseyk, Sarah Bekessy, Ascelin Gordon, James E.M. Watson, Pia E. Lentini, Philip Gibbons, Hugh P. Possingham, Richard J. Hobbs, David A. Keith, Brendan A. Wintle and Megan C. Evans. "Taming a Wicked Problem: Resolving Controversies in Biodiversity Offsetting." *BioScience* (Advance Access published April 13, 2016). [macroecointern.dk/pdf-reprints/Maron\\_BioScience.pdf](http://macroecointern.dk/pdf-reprints/Maron_BioScience.pdf).
- McDermott, Larry, and Anne Bell, *Indigenous Perspectives on Conservation Offsetting: Five Case Studies from Ontario, Canada*, Toronto: Ontario Nature, Plenty Canada and the Indigenous Environmental Studies and Sciences Program at Trent University, 2017. [ontarionature.org/protect/habitat/PDFs/Indigenous%20Perspectives%20on%20Conservation%20Offsetting%20final\\_796kb.pdf](http://ontarionature.org/protect/habitat/PDFs/Indigenous%20Perspectives%20on%20Conservation%20Offsetting%20final_796kb.pdf).
- McKenney, Bruce A., and Joseph M. Kiesecker. "Policy Development for Biodiversity Offsets: A Review of Offset Frameworks." *Environmental Management* 45 (2010).
- Ministère du Développement durable, de l'Environnement, et des Parcs, Les milieux humides et l'autorisation environnementale. Québec: Ministère du Développement durable, de l'Environnement et des Parcs, Direction du patrimoine écologique et des parcs, Direction des politiques de l'eau et Pôle d'expertise hydrique et naturel, 2012. [mdelcc.gouv.qc.ca/eau/rives/milieux-humides-autorisations-env.pdf](http://mdelcc.gouv.qc.ca/eau/rives/milieux-humides-autorisations-env.pdf).
- Moreno-Mateos, D., M.E. Power, F.A. Comin and R. Yockteng. "Structural and functional loss in restored wetland ecosystems." *PLOS Biology* 10:1 (2012).
- National Research Council. *Compensating for Wetland Losses Under the Clean Water Act*. Washington, DC: National Academies Press, 2001. [nap.edu/read/10134/chapter/1](http://nap.edu/read/10134/chapter/1).
- New Brunswick Department of the Environment. Wetland Mitigation Operational Protocols (draft). June 19, 2009.
- New Brunswick. Fact Sheet: Wetland Compensation in New Brunswick. (n.d.).
- New Brunswick Natural Resources and Energy and New Brunswick Environment and Local Government. *New Brunswick Wetlands Conservation Policy*. July 2002. [www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Report-Rapport/WetlandsTerresHumides.pdf](http://www2.gnb.ca/content/dam/gnb/Departments/env/pdf/Report-Rapport/WetlandsTerresHumides.pdf).
- Newfoundland and Labrador Department of Environment and Conservation. Policy for Development in Wetlands. Re-issue date January 17, 2001. [ecc.gov.nl.ca/waterres/regulations/policies/wetlands.html](http://ecc.gov.nl.ca/waterres/regulations/policies/wetlands.html).
- Noga, Warren, and W.L. Adamowicz. *A Study of Canadian Conservation Offset Programs*. Ottawa: Sustainable Prosperity, 2014.
- Ontario Ministry of Indigenous Relations and Reconciliation. The Journey Together: Ontario's Commitment to Reconciliation with Indigenous Peoples. Toronto: May 30, 2016. [news.ontario.ca/mirr/en/2016/05/the-journey-together-ontarios-commitment-to-reconciliation-with-indigenous-peoples.html](http://news.ontario.ca/mirr/en/2016/05/the-journey-together-ontarios-commitment-to-reconciliation-with-indigenous-peoples.html).
- Ontario Ministry of Municipal Affairs and Housing. *Municipal-Aboriginal Relationships: Case Studies* (last modified October 25, 2015). [mah.gov.on.ca/Page6054.aspx](http://mah.gov.on.ca/Page6054.aspx).
- Ontario Ministry of Municipal Affairs and Housing. *Provincial Policy Statement 2014*. [mah.gov.on.ca/AssetFactory.aspx?did=10463](http://mah.gov.on.ca/AssetFactory.aspx?did=10463).
- Ontario Ministry of Natural Resources and Forestry (MNRF). *A Wetland Conservation Strategy for Ontario 2017–2030*. 2017. [apps.mnr.gov.on.ca/public/files/er/a-wetland-conservation-strategy-for-ontario-2017-2030.pdf](http://apps.mnr.gov.on.ca/public/files/er/a-wetland-conservation-strategy-for-ontario-2017-2030.pdf).
- Ontario Ministry of Natural Resources and Forestry (MNRF). *Wetland Conservation in Ontario: A Discussion Paper*. 2015. [ontla.on.ca/library/repository/mon/29007/331299.pdf](http://ontla.on.ca/library/repository/mon/29007/331299.pdf).
- Ontario Nature. *Biodiversity Offsetting in Ontario: Issues, Accomplishments and Future Directions – Summary of Ontario Nature's 2014–2016 Project*. Toronto: Ontario Nature, October 2016. [ontarionature.org/discover/resources/PDFs/reports/Biodiversity\\_Offsetting\\_in\\_Ontario\\_Summary%20of\\_Ontario\\_Nature's\\_2014-2016\\_Project\\_Report.pdf](http://ontarionature.org/discover/resources/PDFs/reports/Biodiversity_Offsetting_in_Ontario_Summary%20of_Ontario_Nature's_2014-2016_Project_Report.pdf).
- Ontario Nature. *Biodiversity Offsetting in Ontario: Summary of Ontario Nature's 2013–2014 Project*. Toronto: Ontario Nature, 2014. [ontarionature.org/discover/resources/PDFs/reports/Biodiversity\\_Offsetting](http://ontarionature.org/discover/resources/PDFs/reports/Biodiversity_Offsetting)

[Ontario.pdf](#).

- Poulin, Monique, Stéphanie Pellerin, Jérôme Cimon-Morin, Sophie Lavallée, Geneviève Courchesne and Youri Tendland. "Inefficacy of wetland legislation for conserving Quebec wetlands as revealed by mapping of recent disturbances," *Wetlands Ecology and Management* 24 (2016): 651–665.
- Poulton, D. *Key Issues in Biodiversity Offset Law and Policy: A Comparison of six jurisdictions*. Toronto: Ontario Nature, June 2015. [ontarionature.org/protect/habitat/PDFs/Key\\_Issues\\_In\\_Biodiversity\\_Offset\\_Law\\_and\\_Policy\\_A\\_Comparison\\_of\\_Six\\_Jurisdictions\\_Final.pdf](http://ontarionature.org/protect/habitat/PDFs/Key_Issues_In_Biodiversity_Offset_Law_and_Policy_A_Comparison_of_Six_Jurisdictions_Final.pdf).
- Poulton, Dave. Alberta's New Wetland Policy as a Conservation Offset System. ABlawg.ca September 25, 2013. [ablawg.ca/2013/09/25/albertas-new-wetland-policy-as-a-conservation-offset-system](http://ablawg.ca/2013/09/25/albertas-new-wetland-policy-as-a-conservation-offset-system).
- Poulton, David W. "Offsetting for 'Serious Harm': The Recent Evolution of Section 35 of the Fisheries Act, 1985." *Journal of Environmental Law and Practice*, 2016.
- Poulton, David W. "Biodiversity and Conservation Offsets: A Guide for Albertans." CIRL Occasional Paper No. 48. Canadian Institute of Resources Law. Calgary: May 2015.
- Poulton, David W. *Biodiversity Offsets: A Primer for Canada*. Ottawa: Sustainable Prosperity and the Institute of the Environment at the University of Ottawa, February 2014.
- Quétier, Fabien, and Sandra Lavorel. "Assessing Ecological Equivalence in Biodiversity Offset Schemes: Key Issues and Solutions." *Biological Conservation* 2991 (2012) 144:12.
- Quigley, Jason T., and David J. Harper. "Effectiveness of Fish Habitat Compensation in Canada in Achieving No Net Loss." *Environmental Management* 37:3 (2006), 351–366. [ceaa-acee.gc.ca/050/documents/48711/48711F.pdf](http://ceaa-acee.gc.ca/050/documents/48711/48711F.pdf).
- Ramsar Convention on Wetlands, Scientific and Technical Review Panel. *Avoiding, Mitigating, and Compensating for Loss and Degradation of Wetlands in National Laws and Policies*, Briefing Note Number 3. April 2012. [ramsar.org/sites/default/files/documents/library/bn3.pdf](http://ramsar.org/sites/default/files/documents/library/bn3.pdf).
- Ramsar Convention Secretariat. The List of Wetlands of International Importance. February 2, 2017 11. [ramsar.org/sites/default/files/documents/library/sitelist.pdf](http://ramsar.org/sites/default/files/documents/library/sitelist.pdf).
- Ramsar Convention, Canada. [ramsar.org/wetland/canada](http://ramsar.org/wetland/canada).
- Rubec, Clayton, Ingrid Kessel-Taylor and Pauline Lynch-Stewart. *Wetlands and Government: Policy and Legislation for Wetland Conservation in Canada*. Ottawa: North American Wetlands Conservation Council (Canada), 1999.
- Salzman, James, and J.B. Ruhl. "Currencies and the Commodification of Environmental Law." *Stanford Law Review* 53:3 (2000).
- Scallen, Don. "Here today, gone tomorrow." *ON Nature*, Spring 2017, 24–28.
- SENEC Consultants Ltd. *Fish Habitat Banking in Canada: Opportunities and Challenges*. Richmond Hill: 2012. [dfo-mpo.gc.ca/Library/347440.pdf](http://dfo-mpo.gc.ca/Library/347440.pdf).
- ten Kate, Kerry, and M.L.A. Crowe. *Biodiversity Offsets: Policy options for governments*. An input paper for the IUCN Technical Study Group on Biodiversity Offsets. Gland, Switzerland: IUCN, 2014.
- ten Kate, Kerry, Josh Bishop and Ricardo Bayon, *Biodiversity Offsets: Views, Experience, and the Business Case*. Gland, Switzerland: IUCN and Insight Investment, 2004, 70. [cmsdata.iucn.org/downloads/bdoffsets.pdf](http://cmsdata.iucn.org/downloads/bdoffsets.pdf).
- Troy, Austin, and Ken Bagstad. *Estimating Ecosystem Services in Southern Ontario*, Report prepared for the Ontario Ministry of Natural Resources. Pleasanton CA: Spatial Informatics Group, 2009.
- Trudeau, Justin. Statement by the Prime Minister of Canada on advancing reconciliation with Indigenous Peoples. Ottawa: December 15, 2016. [pm.gc.ca/eng/news/2016/12/15/statement-prime-minister-canada-advancing-reconciliation-indigenous-peoples](http://pm.gc.ca/eng/news/2016/12/15/statement-prime-minister-canada-advancing-reconciliation-indigenous-peoples).
- Schindler, David and Jim Bruce. "Freshwater Resources." In *Climate Change Adaptation: A Priorities Plan for Canada, Report of the Climate Change Adaptation Project* (Canada), Blair Feltmate and Jason Thistlewaite. Intact Insurance and University of Waterloo, June 2012. [uwaterloo.ca/environment/sites/](http://uwaterloo.ca/environment/sites/)

[ca.environment/files/uploads/files/CCAP-Report-30May-Final.pdf](https://www.ca.environment/files/uploads/files/CCAP-Report-30May-Final.pdf).

Unger, Jason. "Lamenting What We HADD? A Fisheries Act Habitat Dirge or Much Ado About Nothin"  
*Journal of Environmental Law and Practice* 29 (2016).



## About Ontario Nature

Ontario Nature protects wild species and wild spaces through conservation, education and public engagement. Ontario Nature is a charitable organization representing more than 30,000 members and supporters, and 150 member groups across Ontario.



214 King Street West, Suite 612

Toronto, ON M5H 3S6

Tel: 416-444-8419

Fax: 416-444-9866

Toll free (within Ontario): 1-800-440-2366

[info@ontarionature.org](mailto:info@ontarionature.org)

[ontarionature.org](http://ontarionature.org)